

ओ३म्

आर्यभट्ट

विज्ञान-पत्रिका

अप्रैल १९८१

सम्पादक :

डॉ० विजय शंकर

अध्यक्ष : वनस्पति विज्ञान विभाग

परामर्शदाता :

प्रो० सुरेश चन्द्र त्यागी

प्राचार्य : विज्ञान महाविद्यालय

प्रकाशक :

गुरुकुल कांगड़ी विश्वविद्यालय, हरिद्वार

उत्तर - प्रदेश

मूल्य : ५-००

मुखपृष्ठ : प्रेम जुयाल

विषय-सूची

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आभार प्रकट

गुरुकुल कांगड़ी प्रिंटिंग प्रेस ने जिस तत्परता एवं लग्न के साथ विज्ञान पत्रिका का इतने कम समय में प्रकाशित करने में योगदान दिया है उसके लिये हम डॉ० हरिप्रकाश जी जनरल मैनेजर गुरुकुल कांगड़ी फार्मेसी एवं मुद्रणालय, श्री श्रीकृष्ण जी, श्री प्रद्युम्न कुमार जी पाण्डे एवं प्रेस के समस्त कर्मचारियों का हृदय से आभार प्रकट करते हैं।

सम्पादक

आचार्य : सुरेश चन्द्र त्यागी

८ अप्रैल १९८१

संदेश

मुझे यह जानकर हार्दिक प्रसन्नता हुई कि इस वर्ष दीक्षान्त समारोह के अवसर पर गुरुकुल कांगडी विश्वविद्यालय "आर्य भट्ट विज्ञान पत्रिका" प्रकाशित कर रहा है। मै आशा करता हूँ कि यह सरल हिन्दी भाषा मे जन साधारण तक विज्ञान एव टेकनालाजी की जानकारी पहुचाने की सफल माध्यम सिद्ध होगी। विश्वविद्यालय से हिन्दी भाषा मे प्रकाशित होने वाली यह प्रथम वैज्ञानिक पत्रिका है। इस अकमे वेदो मे उपलब्ध विज्ञान से लेकर आधुनिक वैज्ञानिक विषयो पर लेख प्रकाशित हुए है। सम्पादक महोदय ने कतिपय वैज्ञानिक अन्वेशणो एव समस्याओ को पद्य बद्ध रचनाओ मे प्रस्तुत करके विज्ञान को लोकप्रिय बनाने मे एक नई दिशा प्रदान की है।

मुझे पूर्ण आशा है कि पत्रिका जन साधारण एव विद्यार्थियो की भारत के विज्ञान के प्रति आस्था को बलवती करेगी एव उन्हे समाज की वर्तमान समस्याओ जैसे ऊर्जा एव प्रदूषण आदि से जूझने के लिए प्रेरित करेगी।

मैं इस नवीन प्रकाशन की सफलता की हृदय से कामना करता हुआ विज्ञान महाविद्यालय के प्राचार्य श्री सुरेशचन्द्र त्यागी और इनके सहयोगियों डा० विजय शकर, प्रो० हरिशचन्द्र ग्रोवर इत्यादि को इस उपक्रम पर बधाई देता हूँ।

बलभद्रकुमार हूजा
कुलपति

प्रो० ए ० जी० के० मेनन
महानिदेशक

वैज्ञानिक एव औद्योगिक अनुसधान परिषद
न्यू दिल्ली-११०००१

अ. स स० डीजो / सी एस आई आर / ८१-

दिनांक : मार्च, १९८१

प्रिय श्री शकर,

मुझे यह जानकर प्रसन्नता है कि गुरुकुल कागड़ी विश्वविद्यालय अपने दीक्षान्त समारोह के अवसर पर 'आर्य भट्ट' नामक पत्रिका प्रकाशित कर रहा है। विज्ञान और प्रौद्योगिकी से सबन्धित सिद्धान्त और ज्ञान के साथ इसमे अन्तर्निहित दर्शन, विधि एव दृष्टिकोण, जिनसे विज्ञान का निरुपण होता है, का भी प्रचारण बहुत महत्वपूर्ण है। हमारे समाज मे वैज्ञानिक चेतना का जिस सीमा तक समावेश हो सकेगा अन्ततः उसी मे हमारी न केवल भौतिक बल्कि मानवीय खुशहाली और जीवन स्तर को सच्ची प्रगति परिभाषित हो सकेगी।

मै प्रकाशन की हर सफलता की कामना करता हूं।

आपका

एम. जी. के. मेनन

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डा० त्रिलोकी नाथ खुशू
निदेशक

राष्ट्रीय वनस्पति अनुसधान सस्थान
लखनऊ

मुझे यह जानकर हार्दिक प्रसन्नता है कि गुरुकुल कांगड़ी विश्वविद्यालय, हरिद्वार इस वर्ष जनसाधारण के लिए सुबोध हिन्दी भाषा में 'आर्यभट्ट' पत्रिका प्रकाशित कर रहा है जिसका उद्देश्य विज्ञान और तकनालाजी की उपलब्धियों को आम लोगों तक पहुँचाना है। मै आशा करता हूं कि इससे जन सामान्य में विज्ञान के प्रति अभिरुचि बढ़ेगी और हिन्दी को उसका गौरवपूर्ण स्थान मिलने में सहायता मिलेगी। गुरुकुल कागड़ी विश्वविद्यालय सचमुच, इस प्रयास के लिए बधाई का पात्र है और मै आर्यभट्ट' पत्रिका की सफलता हेतु हृदय से कामना करता हूँ।

त्रिलोकी नाथ खुशू

केन्द्रीय भवन अनुसंधान संस्थान, रुड़की--२४७६६७ (भारत)

निदेशक

पत्रांक १८८ / सूचना ' ८१
दिनाक २३-३-१९८१

यह जानकर अत्यन्त प्रसन्नता हुई कि गुरकुल कागडो विश्वविद्यालय हरिद्वार अपने दीक्षान्त समारोह के अवसर पर इस वर्ष विज्ञान एव टैक्नोलोजी की जानकारी जन-साधारण को उपलब्ध कराने के निमित्त "आर्यभट्ट" नाम से एक पत्रिका का प्रकाशन कर रहा है। मुझे आशा है कि हिन्दी भाषा मे प्रकाशित इस पत्रिका का देश मे उपलब्ध विज्ञान एव तकनीकी ज्ञान को जन साधारण तक पहुचाने मे अपना एक विशिष्ट महत्वपूर्ण योगदान रहेगा तथा पत्रिका का प्रकाशित यह अक सग्रहणीय होगा।

पत्रिका की सफलता के लिये मे अपनी हार्दिक शुभ कामनाये भेज रहा हूँ।

निदेशक
दिनेश मोहन

दूरभाष कार्यालय हरिद्वार १२६ निवास हरिद्वार २५४ टेलेक्स न० ०५६५-२४१ एव २४४

प्रेम सागर गुप्ता
अधिशासी निदेशक

भारत हैवी इलैक्ट्रिकल्स लिमिटेड
रानीपुर, हरिद्वार-२४६४०३

सन्देश

मुझे यह जानकर अत्यन्त प्रसन्नता है कि गुरुकुल कागडी विश्वविद्यालय अपने दीक्षान्त समारोह के अवसर पर "आर्य भट्ट" पत्रिका प्रकाशित कर रहा है। खासतौर से मुझे यह जानकर खुशी हुई कि इस प्रत्रिका मे सरल और सुबोध हिन्दी मे विज्ञान और टेक्नोलाजी सम्बन्धी जानकारी दी जाएगी। यह प्रयास सचमुच प्रशसनीय है।

हमारे देश ने विज्ञान और टेक्नोलाजी के क्षेत्र मे महत्वपूर्ण प्रगति की है, जिसका फल हमारे सभी साथी देशवासियो को प्राप्त हो रहा है। यह भी समान रूप से महत्वपूर्ण है कि इस क्षेत्र मे हुई प्रगति लोगो तक उस भाषा मे प्रचारित की जाय जिसे वे आसानी से समझ सके।

मैं इस प्रयास की सफलता की कामना करता हू।

प्रेम सागर गुप्ता
अधिशासी निदेशक

VINOD K GAUR FNA PROFESSOR OF GEOPHYSICS
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पत्र सं. ड्लि / सामान्य / एस-३६/
दिनाक २६ मार्च १९८१

सेवा में

सम्पादक,
"आर्य भट्ट"
गुरुकुल कागडी विश्वविद्यालय,
हरिद्वार—२४६४०४.

महोदय !

मुझे यह जानकर अति प्रसंन्नता हुई कि विज्ञान महाविद्यालय, गुरुकुल कागडी, सरल सुबोध जन साधारण मे विज्ञान एवं टैक्नालाजी को जानकारी बढ़ाने के लिए 'आर्य भट्ट' पत्रिका प्रकाशित कर रहा है। मुझे आशा है कि यह पत्रिका जन साधारण मे विज्ञान एवं तकनीकी जानकारी के विस्तार की आवश्यकता की पूर्ति करेगी तथा उनमे देश में हुई तकनिकी उपलब्धियो के प्रति प्रेरणा उत्पन्न करेगी।

भवदीय
विनोद कुमार गौड़



विकास व आधुनिकीकरण तथा प्रगति और समृद्धि को बढाने वाले कारक के रूप मे
विज्ञान मे नेहरू जी का अपार एव दृढ विश्वास था । १९४७ मे स्वतन्त्रता प्राप्ति
के पश्चात् देश के राजनीतिक और वैज्ञानिक नेतृत्व के मध्य बने समीकरण
"नेहरू - भटनागर - प्रभाव" के फलस्वरूप देश के विभिन्न भागो मे
राष्ट्रीय प्रयोगशालाये खुली । इनका सुफल हमे आज प्राप्त
हो रहा है । ऐसे प्रबुद्ध नेतृत्व के प्रति हम अपनी
कृतज्ञता प्रकट करते है ।

(चित्र—अगस्त सन् १९५८ मे श्री जवाहरलाल नेहरू विज्ञान-भवन का उद्घाटन करने के लिए गुरुकुल कागडी विश्वविद्यालय मे पधारे थे) ।

सम्पादकीय

विश्वविद्यालय प्रणाली के समाज के प्रति महत्वपूर्ण उत्तरदायित्व है। इस प्रणाली के अनेक कार्यों मे से एक समाज मे वैज्ञानिक मन-स्थिति एव तर्कशील दृष्टि कोण को पनपाना है। अन्धविश्वास को दूर करना है। ज्ञान को विकसित करना और उसे साधारण जन तक पहुंचाना जिसमे उनके व्यक्तित्व का पूर्ण रूप से विकास हो सके, यह कार्य भी विश्वविद्यालय का ही है। इस श्रृंखला मे विचार करते हुये गुरुकुल कागडी विश्वविद्यालय के वर्तमान कुलपति श्री गोवर्द्धन बलभद्र कुमार जी हूजा ने विश्वविद्यालय से अनेक ज्ञानवर्द्धक पत्रिकाये प्रकाशित करने का निर्णय लिया। विज्ञान की यह पत्रिका उनमे से एक है। श्री कुलपति जी के पवित्र उपक्रम एव प्रेरणा के फलस्वरूप यह पत्रिका आज आपके हाथो मे है। पत्रिका के प्रकाशन के लिए समय कम था, अतः यदि इसमे कुछ त्रुटियाँ रह गई हो तो पाठक उन्हे क्षमा करेगे। इसमे प्रकाशित सामग्री, जिनका पूरा उत्तरदायित्व लेखको का अपना है, यदि आपके मस्तिष्क की एक भी नई खिडकी विश्व पर खोल देती है, लेखो के पढ़ने से यदि आपको आस्था एव निष्ठा भारत की संस्कृति एव विज्ञान के प्रति बलवती होती है, यदि लेख आपको समाज की समस्याओ से अवगत कराते हैं और उनसे जूझने के लिए आपको प्रेरित करते हैं तो विश्वविद्यालय द्वारा इस पत्रिका का प्रकाशन हम सफल समझेगे। पत्रिका वैज्ञानिको को, अध्यापकों एव विद्यार्थीयो को वैज्ञानिक विषयों पर हिन्दी मे लिखने को प्रोत्साहित करेगी ऐसी आशा की जाती है। गुरुकुल कागड़ी विश्वविद्यालय मे हिंदी मे प्रकाशित होने वाली यह प्रथम वैज्ञानिक पत्रिका है।

हिन्दी के माध्यम से जब विज्ञान के प्रसार की बात आती है तो अनायास गुरुकुल के उन विद्वानो की ओर हमारा ध्यान आकृष्ट होता है जिन्होने विज्ञान की पुस्तको को अंग्रेजी भाषा से हिन्दी भाषा मे अनूदित किया। इनमें अग्रणी होने का श्रेय वर्तमान कुलपति जी के पिता जी श्री गोवद्धन जी को जाता है। बाद में गुरुकुल के पूर्व कुलपति श्री सत्यव्रत जी के कार्यकाल मे डा० विजयशकर, डा० चम्पत स्वरुप, डा० कृष्णकुमार प्रो० भूमदेव और प्रो० बुद्ध प्रकाश आदि ने इस क्षेत्र मे सराहनीय कार्य किया।

गुरुकुल कांगडी विश्वविद्याय के संस्थापक स्वामी श्रद्धानन्द जी का यह विचार था कि गुरुकुल मे वेद, सस्कृत आदि के साथ-साथ विज्ञान की शिक्षा भी दी जानी चाहिए। हमें प्रसन्नता है कि उनके इस विचार को यह पत्रिका कुछ अंशों में साकार कर रही है। इस अवसर पर उस महान् संन्यासी की याद आना स्वाभाविक है। उनको हमारा शत-शत प्रणाम।

पत्रिका सरल सुबोध हिन्दी भाषा में है। यह जनसाधारण एव विद्यार्थियो को विज्ञान एवं टेक-

नोलोजी की जानकारी और उनकी उपयोगिता से अवगत करायेगी। विज्ञान क्या है ? यह उन तथ्यो की एक क्रमानुगत व्यवस्था है जिनकी जानकारी हम अपने आस पास के ससार का अध्ययन करके प्राप्त करते है। इन तथ्यो को अलग अलग विज्ञानो मे बाट दिया गया है– पौधो का अध्ययन, सितारो एव अतरिक्ष के पिण्डो का अध्ययन, जन्तुओ का अध्ययन। लेकिन विज्ञान तथ्यों के क्रमानुगत व्यवस्था से कुछ अधिक है। यह विचार और तर्क करने की एक प्रणाली भी है, सत्य को खोजने की एक विधि। हमे इस बात का गर्व है कि भारत वह देश है जहाँ वैज्ञानिक प्रणाली सर्व प्रथम प्रयोग मे लाई गई। वैज्ञानिक और औद्योगिक अनुसधान का उद्देश्य ज्ञान संचित करना, समाज की सेवा के लिए ज्ञान का उपयोग करना और औद्योगिक एव आर्थिक विकास को उत्प्रेरित करना है। प्रत्यक्ष है कि विज्ञान का जन मानस से सीधा सम्बन्ध है।

पत्रिका का नाम भारत के महान खगोल-वैज्ञानिक और गणितज्ञ "आर्य भट्ट" के नाम पर रखा गया है। वह प्रसिद्ध वैज्ञानिक सन् ४७६ मे पटना के पास कुसुमपुरा गाँव में पैदा हुए थे। २३ वर्ष की उम्र मे उन्होंने "आर्य भटीयम" नामक ग्रथ की रचना की। उन्होने प्रथम बार 'पाये' का निकटतम मूल्य सुझाया। आर्य भट्ट की भाँति भारत मे प्राचीन समय मे अनेक अन्य वैज्ञानिक भी हुए है जिन्होने ज्ञान विज्ञान के क्षेत्र मे सराहनीय योग दान दिया है — जैसे अश्विनी कुमार, जीवक, भास्कराचार्य, कणाद, कपिल, नागार्जुन, अग्निवेश, आत्रेय, ऋभु नाम से जाने वाले इञ्जीनियर, चरक सुश्रुत आदि।

हमारे प्राचीन ग्रथो मे अनेक वैज्ञानिक विषयों पर सामग्री मिलती है। अश्वनी कुमार ने, जो प्रसिद्ध व शल्य चिकित्सक होते थे, शल्य चिकित्सा के क्षेत्र मे चमत्कारी सफलता प्राप्त की। ऐसा उल्लेख है कि उन्होने विश्वपाल की टूटी टाग के स्थान पर लोहे की टाग लगाई, भागा की खराब आँख को निकाल कर उसके स्थान पर नई आख लगाई, इन्द्र के लकवे-ग्रस्त हाथ को ठीक किया, वृद्ध च्वयन को यौवन प्रदान किया, यज्ञ के कटे हुए सिर को फिर से लगा दिया और दधीची के कटे हुए सिर के स्थान पर पहले घोडे का और बाद मे उनका स्वय का सिर लगा दिया। एक अन्य वैज्ञानिक जीवक वनस्पतियो का गहन अध्ययन करके इस निष्कर्ष पर पहुचे कि प्रत्येक वनस्पति की उपयोगिता है और कोई वनस्पति बेकार नही है। इस पृथ्वी पर समुपलब्ध साहित्य के सबसे प्राचीन ग्रथ वेदो मे यज्ञ द्वारा चिकित्सा एव पर्यावरण को शुद्ध रखनेका वर्णन मिलता है। अनेक ऐसे पौधे जिनके औषधीय गुणो का वर्णन हमारे प्राचीन ग्रन्थो मे उपलब्ध है, आधुनिक विज्ञान की कसौटी पर खरे उतरे है, जैसे– सर्पगधा, गुग्गुल, ब्राह्मी बूटी, अपामार्ग, रुद्रवन्ती, कनेर, लहसुन, शुन्निशन्नक घृतकुमारी आदि। हमारे पूर्वजो की विज्ञान के क्षेत्र मे रुचि, सफलता एव उपलब्धियाँ हमारे लिए एक ऐसी निधि है जिनसे हमे सदैव प्रकाश मिलता रहेगा और जो हमारे लिये प्रेरणा के स्रोत है। विज्ञान का शायद ही कोई क्षेत्र रहा हो जिसने उन्हे आकर्षित न किया हो।

चरक (दूसरी शताब्दी ई० पू०) ने शरीर और मानसिक स्वास्थ्य के लिये अच्छे चाल-चलन पर जोर दिया। उन्होंने शरीर-रचना विज्ञान, अस्थि विज्ञान, निदान, परिचर्या आदि पर

विस्तार से लिखा है। उनका कहना है कि स्वस्थ शरीर और स्वस्थ मन, धर्म, अर्थ, काम, और मोक्ष की प्राप्ति मे सहायक होते है। पश्चिम मे जो आज 'होलिस्टिक हैल्थ' की बात होने लगी है वह वहाँ के लिए नई हो सकती है हमारे देश मे तो स्वास्थ्य की परिभाषा पहले से ही इस प्रकार की है बल्कि इससे भी अधिक पूर्ण।

समदोष समाग्निश्च समधातु मलक्रियः
प्रसन्नात्मेन्द्रियमनः स्वस्थ इत्यमि धीयते।

—चरक

सुश्रुत जो कि कुशल सर्जन थे उनकी कृति सुश्रुत सहिता ईसा से कई शताब्दियो पूर्व प्रचलित सर्जरी के ज्ञान का स्रोत है। उसमे पुराने सर्जनो के अनुभव तथा वैदिक साहित्य मे बिखरे हुये तथ्यो की भी चर्चा है। उन्होने गर्भाधान, जन्म और औषधियो के सबन्ध मे भी लिखा है। मनुष्य मे इस बात की हमेशा उत्सुकता रही है कि पैदा होने वाला बच्चा लडका होगा या लडकी? वह यह भी जानना चाहता है कि क्या मन चाहे सेक्स का बच्चा पैदा करना सम्भव है। सुश्रुत इसके लिये सूचने, भोजन के नियमो और चाल-चलन के नियम बताते है। उन्होने यह भी लिखा है कि किन्ही अपवाद परिस्थिति मे बिना यौन सम्बन्ध के भी शिशु जन्म हो सकता है। सुश्रुत का यह विचर क्या आज के टेस्टट्यूब बेबी की ओर इशारा नही करता रहा होगा। ऑपरेशन के बारे मे निर्देश देते हुये वह लिखते है कि कमरे को सफेद सरसो, नीम की पत्तियो, और साल के गोंद के धुए से स्वच्छ करना चाहिये। उन्होने प्लास्टिक सर्जरी का भी जिक्र किया है।

वेदो मे नभ, जल, और थल तीनो स्थानो में अव्याहत गति से विचरने वाले वायुयान, जलयान, तथा स्थलयान का बहुत विस्तृत वर्णन मिलता है। इसी भाँति भारद्वाज ऋषि कृत वृहत विमान शास्त्र पुराणो तथा महाकाव्यो मे भी वर्णन मिलता है। आधुनिक विश्व मे वैमानिक और अन्तरिक्ष उडान के क्षेत्र मे विलक्षण प्रगति हुई है। जहाँ अन्य देशो मे इस क्षेत्र मे विजय प्राप्त करने की पहल की वहाँ भारतवर्ष ने भी सराहनीय सफलता पायी। १६ अप्रैल १६७५ को भारतीय उपग्रह आर्य भट्ट ने तीस हजार किलो मीटर प्रति घन्टे की गति से पृथ्वी की परिक्रमा करना आरम्भ किया। भारत के साहसी युवा पीढी, भारत के निष्ठावान वैज्ञानिको और उदार नेताओ के कारण ही यह महानउपलब्धि सम्भव हो सकी। उपग्रह टेकनोलोजी के द्वारा मौसम सम्बन्धी भविष्य वाणी, और सचार के क्षेत्र से सम्बन्धी जानकारी देश के जन-जीवन के लिये अत्यन्त उपयोगी सिद्ध होगी। दूर दर्शन और सदेश प्रसारण में उपग्रहो ने तीव्र क्रांति कर डाली। उपग्रहो के द्वारा टेलिविजन प्रसारण से गावो मे शिक्षा का सुन्दर प्रसारण किया जा सकता है। आधी, तूफान और बाढ आदि की पूर्व सूचना उपग्रह से मिल सकती है। पृथ्वी मे छुपी सपदा का ज्ञान भी ये उपग्रह आसानी से करा सकते है। टेलीविजन की बात हमे महाभारत की ओर ले जाती है। उस सुदूर काल मे, कुरुक्षेत्र मे होरहे युद्ध से बहुत दूर बैठे हुए सजय धृतराष्ट्र को युद्ध का पूरा ब्यौरा देते है। सजयके पास कोई दूर दर्शन यत्र था या उनकी आखो को दूर दर्शन की शक्ति प्राप्त थी कहना कठिन है।

आज का युग औद्योगीकरण का युग है।

औद्योगीकरण ने जहाँ एक ओर मानव के लिए अनेक प्रकार की सुविधायें एवं मनोरंजन के साधन प्रदान किये है वहा दूसरी ओर प्रदूषण एवं व्यवसायिक रोगो को पैदा करके नई समस्याये भी खडी कर दी हैं। विश्व की बढ़ती हुई जनसख्या और औद्यौगीकरण के कारण एक अन्य सकट जो मुह बाये खडा है ऊर्जा का सकट है। आज से ६०० मिलियन वर्ष पूर्व जिस गति से प्राकृतिक प्रक्रियाओ द्वारा पैट्रोलियम बना था आज का संसार उसे लाखो गुना तेज गति से खर्च कर रहा है। स्पष्ट है कि पेट्रोलियम को मात्रा तेजी के साथ कम होती जाएगी और इस का मूल्य बढता चला जाएगा। पेट्रोलियम पृथ्वी मे एक सीमित मात्रा मे विद्यमान है। इस बात का अनुभव करते हुए आज पूरा विश्व इस बात को समझ रहा है कि वह समय भी आयेगा जब जीवाश्म ईंधन (पेट्रोलिय कोयला, आदि), जो कि वर्तमान मे ऊर्जा का एक जबरदस्त स्रोत है समाप्त हो जाएगा। अतः भविष्य के लिए ऊर्जा के नये स्रोतो की खोज हो रही हैं। भविष्य में ऊर्जा का एक स्रोत न्यूक्लियर एनर्जी हो सकता है। सौर्य ऊर्जा की बात भी चल पड़ी है। एक अन्य असाधारण स्रोत जिसकी ओर हमारा ध्यान आकृष्ट हो रहा है हमारे जाने पहचाने पौधे हैं। कुछ ही समय पूर्व ब्राजील ने सारे विश्व का ध्यान अपनी ओर केन्द्रित किया। यह राष्ट्र प्रति वर्ष ४ हजार मिलियन डालर मूल्य का तेल आयात करता है। इस व्यय को ५० प्रतिशत कम किया जा सकता है यदि ब्राजील अपने कारो मे गेसोलीन के स्थान पर एलकोहल प्रयोग करने लगे। वहाँ गन्ना और कसावा की खेती बड़े पैमाने पर की जाने की योजना है। इन पौधो से किण्वन द्वारा ईथेनाल बनाया जायेगा जिससे वहाँ की कारे चलेगी। ब्राजील एक गर्म जलवायु वाला देश है और यहाँ खेती के लिए भूमि प्रचुर मात्रा में उपलब्ध है। डा० जोस गोल्डेमबर्ग के अनुसार यदि ब्राजील वर्तमान की अपेक्षा तीन-प्रतिशत अधिक भूमि मे गन्ने की फसल उगाने लगे तो इस शताब्दी के अन्त तक देश में यातायात के लिए उपयोग होने वाला ईधन देश के अन्दर ही पैदा होने लगेगा। भारत जहा की जल वायु इस प्रकार की फसल उगाने के लिये उपयुक्त है ब्राजील का अनुसरण करके यातायात के लिये ईंधन मे आत्म निर्भर हो सकता है। इसी प्रकार कुछ अन्य देश भी हैं जो ब्राजील के उदाहरण का लाभ उठा सकते हैं। अमेरिका भी, यद्यपि वहाँ की जलवायु ब्राज़ील से भिन्न है, इस दिशा में कदम बढ़ा चुका है। भूतपूर्व प्रेजीडेंट कार्टर के अनुसार अमेरिका १९८२ तक प्रतिवर्ष तीन सौ मिलियन गैलन ईथेनॉल का उत्पादन कर सकता है और १९८५ तक यह मात्रा तिगुनी हो जायेगी। किन्तु जो राष्ट्र प्रति वर्ष ११०००० मिलियन गैलन गैसोलीन खर्च करता हो उसके लिये उपरलिखित ईथेनॉल की मात्रा मे वृद्धि कोई विशेष अन्तर नहीं लायेगी। फिर भी वहाँ पौधो से द्रव्य ईंधन निकालने के लिये प्रयत्न जारी है। गन्ना, चुकन्दर, मक्का, ज्वार, गेहूँ, एल्फेल्फा एवं समस्त प्रकार का जैव-कचरा (आरगैनिक वेस्ट) का उपयोग ईथेनॉल बनाने मे हो सकता है। प्रोफेसर केलविन ने, जिन्हे १९६१ में प्रकाश सश्लेषण पर किये गये शोध कार्य पर नोबेल प्राइज़ मिला, एक ऐसे पौधे से तेल बनाने का दावा किया है जिसके पत्तों में लेटेक्स (दूध-एक सफेद सरल पदार्थ) होता है। केलविन के अनुसार इस पौधे से, जिसका नाम यूफार्बिया लेथाइरिस है, प्रति हेक्टर पच्चीस बैरल तेल का

उत्पादन हो सकता है । प्रति बैरल मूल्य २० डालर पड़ेगा । इस पौधे के पत्तों को कुचल कर उनका लेटैक्स निकाला जाता है । इस लेटैक्स को एक विलायक मे मिलाते हैं जिसके फलस्वरूप एक काले रंग का तेल जो बिल्कुल क्रूड ग्रायल की तरह होता है बनता है ।

वर्तमान जगत की एक ग्रन्य समस्या जो भयावय रूप से मानव सभ्यता को निगल जाने के लिये ग्रपने पंजे बढ़ा रही है प्रदूषण की समस्या है । प्रत्येक व्यक्ति की पर्यावरण के प्रति सहनशीलता की निश्चित सीमाए हैं ग्रौर जब कोई कारक इन सीमाग्रों से ग्रधिक मात्रा मे उपस्थित होता है उसे प्रदूषण कहते हैं । इससे निपटने के लिये, वातावरण मे इस विष वमन की प्रतिक्रिया को रोकने के लिये सभी देशों की सरकारे प्रयत्नशील है । इस विष को पीने के लिये भगवान शिव की तरह सबसे ग्रधिक सफल माध्यम वृक्ष पाये गये है । इनकी पत्तियां वायु मे मिले प्रदूषक पदार्थों के सूक्ष्म कणो को रोक ग्रौर सोख लेती है । पत्थर के कोयले से उत्पन्न प्रदूषक रोकने के लिये जंगल जलेबी नामक वृक्ष का सघन रोपण बहुत लाभकारी पाया गया है । यह धुऐ की साद्रता में लगभग २७ प्रतिशत की कमी ग्रौर सल्फर डाय ग्राक्साइ की सांद्रता मे ८० प्रतिशत की कमी करने में समर्थ पाया गया । शक्तिचालित वाहन जैसे कारे, ट्रक एवं बसे भी प्रदूषण के स्रोत है । यदि सडको ग्रौर मकानो के बीच १० मीटर चौड़ी तथा ६ मीटर ऊंची हरित पट्टिका का विकास किया जाये तो मार्गों से ग्राने वाले कार्बन मोनो ग्राक्साइड की मात्रा में ४४ प्रतिशत कमी हो जाती है ।

वायु के समान जल भी प्रदूषण से मुक्त नही है । कारखानों से निकलने वाले नाना प्रकार के प्रदूषक पदार्थ नदियो में प्रवाहित किये जाते हैं । इसीलिये कानपुर के निकट गगा ग्रौर कलकत्ता के निकट हुगली नदी प्रदूषण का शिकार है । इस समय भारत के १३ नगर जल प्रदूषण से ग्रस्त हैं । कारखानो से निकालने वाले ग्रनेक ट्रेस एलीमेंट नदी के जल मे प्रवाहित हो जाते है जिनमे से कुछ पौधो ग्रौर जन्तुग्रो में मेटाबोलिक एरर पैदा कर देते है जिससे कई प्रकार के रोग हो जाते है जैसे कैंसर, हृदय रोग, स्नायु रोग एव पेट के रोग ।

प्रदूषण के लिये प्राय: जन संख्या को उत्तर दायी माना जाता है । बढती हुई जनसख्या की ग्रावश्यकता की पूर्ति के लिये ग्रधिक ग्रौद्योगीकरण किया जाता है जिससे प्रदूषण मे वृद्धि होती है । किन्तु ग्राज हम देखते हैं कि ग्रनेक विकसित देशो मे जन सख्या कम होने पर भी प्रदूषण ग्रधिक जनसख्या वाले देशो की तुलना मे ग्रधिक है क्योकि वहाँ प्रति व्यक्ति ग्रावश्यकता ग्रधिक है । ग्रत. वास्तविक दोष तृष्णा का है । शायद इसी लिये हमारे वैदिक ऋषियो ने **'इदन्नमम'** को इतना महत्व दिया है ।

प्रदूषण को कम करने के ग्रतिरिक्त पौधो का वातावरण संरक्षण मे भी ग्रत्यधिक महत्व है । वृक्षो का बेहिसाब काटा जाना, जगल के जंगल, साफ कर देना प्रकृति मे ग्रसतुलन पैदा कर देता है । इसके दूर गामी परिणाम होते है—भूमि का ग्रपरदन प्रारम्भ हो जाता है, भूमि कृषि के ग्रायोग्य हो जाती है तापनियत्रण एवं जलचक्र नियन्त्रण बिगड जाता है, जन्तु जोवन के प्राकृ-

तिक निवास एवं वन संपदा नष्ट हो जाते हैं। प्रत्यक्ष है कि वातावरण सरक्षण और वृक्षों का गहरा सम्बन्ध है। 'रक्षया प्रकृति पातु लौका.।' ब्रह्मोद्धिपनिषद का यह वाक्य मनुष्य को सदैव याद रखना पड़ेगा अन्यथा विनाश का वह मार्ग जिस पर वह चल पडा है उसे कही का नही छोड़ेगा। वनस्पतियो की उपयोगिता को ध्यान मे रखते हुये वृक्षारोपण के अभियान को निरतर चालू रखना अत्यावश्यक है। [भूमि पर कृषि के बढते हुये दबाव को सीमित रखने के लिये क्या यह ठीक नही होगा कि हम अनेक प्रकार के खाद्य कुकरमुत्ते (मारशेला, प्लोरोटिस, (ढींगरी) बटनमशरुम, पैडी स्ट्रा मशरुम आदि) को वनस्पति कूडा-कचरा (गेहू का भूसा, चोकर) पर उगाये।]

एक अन्य वैज्ञानिक क्षेत्र जिसने मनुष्य को चौका दिया है 'जैनेटिक इञ्जीनियरिंग' है। ऐसा विचार है कि भविष्य में इस विज्ञान के द्वारा मनचाहे एव पूर्व निश्चित किये गये गुण एवं सेक्सवाले व्यक्ति पैदा किये जा सकेंगे और वह भी बिना यौन सम्बन्ध के। अनेक प्रकार की आनुवाशिक बीमारियों की रोकथाम में भी यह विज्ञान कारगर सिद्ध होगा। एक दूरगामी सम्भावना यह भी है कि यदि किसी दुर्घटना मे किसी व्यक्ति का कोई अंग खराब होता है या टूट जाता है तो वह अंग फिर से शरीर मे अपने स्थान पर निर्मित किया जा सकेगा या फिर प्रयोगशाला में निर्मित हो रहे मानव अंग को शरीर के क्षत हुये अंग के स्थान पर लगा दिया जाये।

ऊपर जिन विषयो की चर्चा सकेत मात्र की गई है उनमे से कुछ पर इस अंक मे लेख प्रकाशित किये जा रहे है। आशा है ये जानकारी पाठकों के लिये उपयोगी सिद्ध होगी।

—डॉ० विजय शंकर

* * *

वेद और विज्ञान

—प्रो० सुरेशचन्द्र त्यागी

वेद और विज्ञान कुछ लोगो को आपस मे एक दूसरे के विरोधी प्रतीत होते हैं, परन्तु यह धारणा गलत है। वेद ईश्वरीय ज्ञान है और यह सब सत्य विद्याओ की पुस्तक है। इस बात की घोषणा वर्तमान युग के महान आचार्य महर्षि दयानन्द सरस्वती ने की। अनेक ज्ञान-विज्ञानो का वेद के मन्त्रो मे भडार भरा पडा है। वेद धर्म पुस्तक है, परन्तु वैसी धर्म पुस्तक नही जो सृष्टि के नियम के विरुद्ध मनघड़न्त बातो और चमत्कारो आदि से भरी पडी हो। धर्म और विज्ञान वेदो मे साथ-साथ चलते हैं। **परन्तु जब धर्म विज्ञान से विहीन होगा तो अन्धविश्वास को जन्म देगा और जब विज्ञान धर्म से विहीन होगा तो पाशविकता बनकर विनाश की ओर अग्रसर होगा अत धर्म और विज्ञान मे समन्वय होना आवश्यक है।**

वेद के विषय चार है। विज्ञान, कर्म, उपासना और ज्ञान। इन सब मे विज्ञान मुख्य है, क्योकि उसमे परमेश्वर से लेकर तृण तक सब पदार्थों का साक्षात् बोध होता है।

अन्धविश्वास और अल्पज्ञता के कारण धर्म और विज्ञान मे विरोध रहा है। ईसाईयत तथा इस्लाम ने विज्ञान को अपना शत्रु समझा। गैलिलियो कहता था कि पृथ्वी गोल है और घूमती है। ईसाई पृथ्वी को चपटी और स्थिर मानते थे। ईसाइयत ने गैलिलियो को जेलमे डाल दिया। ब्रूनो कहता था कि विश्व का केन्द्र सूर्य है और ग्रह उपग्रह उसके चारो ओर घूमते है। इस बात पर उसे जला दिया गया। इस्लाम ने भी अन्धविश्वास मे पडकर विज्ञान पर कई प्रहार किये। ईसाइयत और इस्लाम ने ही नही अपितु बहुत से अन्य अन्धविश्वासी मतावलम्बिओ ने विज्ञान को अपना शत्रु समझा।

वेदो मे विज्ञान है, परन्तु यदि हम उसे खोजेगे नही तो हमारी हालत उस गधे के समान होगी जिसकी पीठ पर चन्दन की लकडियो का गट्ठर लदा हुआ है, परन्तु उस गरीब को इसके मूल्य का कुछ पता ही नही और वह बोझ समझ कर जीवनभर इस बोझ को ढोता रहता।

एक वैज्ञानिक भी महान् तपस्वी और योगी है। बिना कठोर परिश्रम और तप के वैज्ञानिक खोजे नही की जा सकती। वैज्ञानिको ने लगातार कई२ राते जागकर चन्द्रमा और तारों स्थिति की और पृथ्वी पर उनके प्रभाव का पता लगाया। इस प्रकार ज्योतिष विद्या को जन्म दिया। चन्द्रमा आदि ग्रहो पर मानव का पहुंचना, रेडियों, टेलीविजन, हवाई जहाज, एटम बम, हाईड्रोजन बम, पनडुब्बी, टैंक, आदि का आविष्कार वैज्ञानिकों की महान तपस्या का ही तो फल है। आज ये आविष्कार हमें खेल से प्रतीत होते है। बिजली,

रेल, मोटर, कार, टयूबवैल, बीमारियों के जाच करने के तथा उनको नियन्त्रित करने के सैकडो आविष्कारो की तो कोई विशेष गणना ही नही रही।

आज दुनिया बहुत तेजी से बदल रही है यदि भारतवर्ष कदम से कदम मिलाकर वैज्ञानिक क्षेत्र में और देशो के साथ न चला तो हमारा हाल वही होगा जो कि सोमनाथ के मन्दिर पर महमूद गजनवी के आक्रमण के समय हुआ था।

वेदों के ज्ञान भंडार से हम मानवता के लिए उपयोगी विज्ञान की खोज करें तब ही हम आर्य-समाज और महर्षि दयानन्द के सच्चे भक्त कहलाने के अधिकारी होंगे।

वेदों में विज्ञान की खोज की भावना को जगाने के लिए गुरुकुल कांगडी का विज्ञान महा-विद्यालय आर्यभट्ट पत्रिका को निकाल रहा है। और इसी के साथ १० अप्रैल सो साईस प्रदर्शनी का आयोजन कर रहा।

गुरुकुल विश्वविद्यालय के कुलपयि श्री बल-भद्रकुमार हूजा श्री गोवर्धन जी के सुपुत्र हैं और आर्यभट्ट उपग्रह के डायरेक्टर श्री सतीश धवन के बहनोई हैं जिन्हें इस वर्ष गणतन्त्र दिवसपर राष्ट्र-पति महोदय ने पद्मविभूषण की उपाधि से अलकृत किया है। श्रीबलभद्रकुमार जी के पूज्य पिता स्व-र्गीय गोवर्धन जी हुतात्मा स्वामो श्रद्धानन्द जी के समय में गुरुकुल कांगडी मगापार, में हैडमास्टर थे। उन्होंने सबसे पहले फिजिक्स और कैमिस्ट्री में हिन्दी भाषा में छात्रों के लिए पुस्तकें लिखी थीं। अतः श्री कुलपति जी की यह अभिलाषा थी कि 'आर्यभट्ट' पत्रिका हिन्दी में ही निकले जिससे प्रत्येक भारतीय इसे पढ़ सके और मातृ-भाषा के गौरव को अनुभव कर सके उनकी प्रेरणा तथा प्रोत्साहन से आर्यभट्ट पत्रिका का यह प्रथम अक आर्यजगत् को समर्पित है इस आशा और भावना के साथ कि हे आर्यजगत् 'उत्तिष्ठत, जाग्रत प्राप्य वरान् निबोधत'। उठो जागो, और श्रेष्ठ तपस्वी मनीषियो के मार्ग का अनुसरण करके आगे बढो और देश को बढाओ।

आज मानव जीवन का प्रत्येक क्षेत्र विज्ञान और गणित से प्रभावित है। किसी देश की समृद्धि इस बात पर निर्भर करती है कि वह विज्ञान के क्षेत्र में कहा खडा है। आज जीवन का कोई भी क्षेत्र ऐसा नही है जहा गणित का प्रवेश न हो, परन्तु विज्ञान तो गणित के बिना एक कदम आगे नही बढ सकता।

मानव जाति का इतिहास लाखो वर्ष पुराना है। मनुष्य ने कब से गणित का प्रयोग आरम्भ किया यह निश्चित रूप से नही कहा जा सकता तथापि यह निश्चित है कि मानव जाति में अको का प्रयोग अति प्राचीन है। भारत मे गिनती के लिए प्राचीन शब्द 'गणन' है और इसी शब्द से गणित निकला है। गणित का मौलिक अर्थ है गणन किया हुआ अर्थात् गिना हुआ।

अकगणित के इतिहास मे चार देशो के नाम उल्लेखनीय है–भारत, चीन, मैसोपोटियामा और मिस्र। आधुनिक गणित की नीव हिन्दुओं ने डाली है। हिन्दू अंकगणित का प्रभाव चीनियों और अरबों पर भी पड़ा। भारत के कुछ प्रसिद्ध प्राचीन गणितज्ञ भास्कर, आर्यभट्ट, ब्रह्मगुप्त और वराह मिहिर हुए है।

सत्यार्थप्रकाश के सप्तम समुल्लास में महर्षि दयानन्द सरस्वती ने वर्णन किया है कि चारो वेद ईश्वरकृत है। सृष्टि के प्रारम्भ में परमात्मा ने मनुष्यों की भलाई के लिए अग्नि, वायु, आदित्य तथा अङ्गिरा ऋषियों को क्रमशः ऋग्वेद, यजुर्वेद सामवेद और अथर्ववेद का ज्ञान दिया। इस प्रकार सिद्ध होता है कि वेद ईश्वरकृत है। आर्य-समाज के दस नियम है। इसमे प्रथम नियम कहता है कि सब सत्यविद्या और जो पदार्थ विद्या से जाने जाते है, उन सबका आदिमूल परमेश्वर है। तीसरा नियम कहता है कि "वेद सब सत्य विद्याओ की पुस्तक है,वेद का पढना पढाना और सुनना-सुनाना सब आर्यों का परम धर्म है।

अब आइये और देखिये कि किसप्रकार सृष्टि के आदि मे ईश्वर ने गणित का ज्ञान ऋषियो को दिया था।

> ओ३म् तच्चक्षुर्देवहितं पुरस्ता च्छुक्रमुच्चरत। पश्येम शरद शतं जीवेम शरद शत शृणुयाम शरद शत प्र ब्रवाम शरद. शतमदीना स्याम शरदः शतं भूयश्च शरद शतात्।
> (यजुर्वेद ३६।२४)

यह यजुर्वेद का मत्र है जिनका भावार्थ है:— हे सबके चक्षु प्रभो आप अनादिकाल से विद्वानो और ससार के सब प्राणियों के हित के लिए सदा रहने वाले हो। हम आपकी कृपा से प्रभो सौ वर्ष देखे सौ वर्ष जिये। सौ वर्ष सुने, सौ वर्ष बोले। सौ वर्ष तक किसी के आधानी न रहें। उसी ईश्वर की कृपा से हम लोग सौ वर्ष के बाद भी देखें, जीवे, सुनें और स्वतन्त्र रहे।

इस मन्त्र में शतम् शब्द से स्पष्ट है कि गणित का ज्ञान सृष्टि के प्रारम्भ से ही आर्य लोगो को था।

इसी प्रकार वेदो के अन्य मत्रों मे भी स्थान २ पर गणना वाचक शब्द आये हैं जिससे यह ध्रुव सत्य प्रमाणित होता है कि गणित का ज्ञान अति प्राचीन है।

"ईश्वर स्तुति प्रार्थनोपासना" मंत्र मे कहा है कि—

> य. प्राणतो निमिषतो महित्वैक
> इंद्राजा जगतो बभूव।
> य ईश अस्य द्विपदश्चतुष्पदः
> कस्मै देवाय हविषा विधेम।
> [यजुर्वेद २३ ३७]

इस मत्र में एक, द्विपद. और चतुष्पद संख्याओ को प्रकट करते है।

जगत् की उत्पत्ति और वेदों के प्रकाश के आने मे इन ग्यारह गुणो से सम्पन्न व्यक्ति ही गणित को सीख सकता है और उसका आनन्द उठा सकता है। हमारे देश के प्राचीन गणितज्ञ आर्यभट्ट गणित के एक प्रसिद्ध विद्वान् हुए है। परन्तु विरले लोग ही उनके जीवन से परिचित है। महान् गणितज्ञ आर्यभट्ट की याद में भारतवर्ष ने १९ अप्रैल १९७५ ई० को अपना प्रथम उपग्रह 'आर्यभट्ट' अन्तरिक्ष में छोडा। इसने ३० हजार कि० मी० प्रति घटे की गति से पृथ्वी की परिक्रमा की।

आर्यभट्ट का जन्म पटना के पास कुसुमपुर में ४७६ ई० मे हुआ था। इनके तीन ग्रन्थों का पता चलता है—दशगीतिका,आर्यभटीयं और तन्त्र।

इनमे से आर्यभटीय ही सबसे प्रसिद्ध पुस्तक है। पहली दोनों पुस्तकों की पाण्डुलिपिया का पता सर्वप्रथम भाभाउदा जी ने १८६८ ई० में चलाया था। तीसरे ग्रन्थ के नाम के अतिरिक्त कुछ पता नही चल पाया है। आर्यभटीयम् श्लोको मे लिखी गई है। पुस्तक मे पाच अध्याय हैं जिनमे से केवल एक गणित पर है शेष ज्योतिष पर है। उक्त एक अध्याय में आर्यभट्ट ने अंकगणित, बीजगणित, ज्योतिष और त्रिकोणमिति के ३३ सूत्र दिये है।

आर्यभटीय के प्रथम भाग का नाम दशगीतिका है जिसमे ज्योतिषीय सारणिया दी गई है। दूसरे भाग को आर्यष्तशत कहते है। इसमे तीन अध्याय हैं–गणित, कालक्रिया और गोल। गणित के प्रारम्भ में कुछ ज्योतिष परिभाषाये दी गई है। तत्पश्चात् वर्गमूल निकालने का सूत्र आता है। आर्यभट्ट ने अपने ग्रन्थ के कई अनुच्छेदो मे ज्यामितीय विषयो का विवेचन किया है। इसमे मुख्यतः त्रिभुजो, चतुर्भुजो और वृत्तो के क्षेत्रफलो और दोनो के आयतन के सूत्र दिये है। आर्यभट्ट ने आधुनिक बीजगणित की नीव डालने मे भी महान् योगदान दिया है। एक अरब, छियानवे करोड कई लाख और कई हजार वर्ष गुजर चुके है। इस प्रकार गणित विषय की उत्पत्ति को भी इतने ही वर्ष व्यतीत हो चुके है।

गणित नित्य है, शाश्वत है इसके बिना सृष्टि चल ही नही सकती। ग्रह और उपग्रह अपनी धुरी पर, अपने मार्ग पर सूक्ष्म से सूक्ष्म गणना के आधार पर अरबों वर्षों से चल रहे है। सूर्य, चन्द्रमा और तारों का नियमित विचरण गणित का ही चमत्कार है। फिजिक्स, कैमिस्ट्री ज्योतिषविद्या, सांख्यिकि, इतिहास, विज्ञान और भूगोल की आत्मा गणित है। पवित्रता गणित का रुधिर है और शुद्धता इसके प्राण है। अधिकतर छात्र गणित के नाम को सुनकर काप जाते है। गणित को पढ़ने के लिए उसे सीखने के लिए घोर तपस्या करनी पडती है। भाषण बाजी या आयाराम गयाराम की राजनीति से यहा काम नही चलता। गणित को अंग्रेजी भाषा मे मैथेमैटिक्स MATHEMATICS कहते है। इसमे ग्यारह अक्षर है। इसमे से प्रत्येक अक्षर गणित सीखने के इच्छुक छात्र का पथप्रदर्शन करता है। यदि गणित सीखना चाहते हो तो आओ एक एक अक्षर के सागर मे से सागर को भरो।

M—Memony – यावदाश्त (स्मृति)
A—Attention सावधान
T—Talents - असाधारण बुद्धि
H – Hand Labour – कठोर परिश्रम
E – Enthusiasm – उत्साह
M—Mental Power – मानसिक शक्ति
A – Abiliby – योग्यता
T – Tacts - चतुरता
I – Intelligence – बुद्धि, शीघ्र ग्राहिता
C – Cleverness – कुशलता
S—Smile – मुस्कान

* * *

जिन पर हमें गर्व है :

प्रो० हरिशचन्द्र

अन्तरिक्ष अनुसंधान संगठन के अध्यक्ष प्रो० सतीश धवन

(जिन्होंने आर्यभट्ट की नीव से उड़ान तक उच्च कोटि का मार्ग दर्शन दिया)

जन्म स्थान—

भारत की साहसिक युवा पीढ़ी के निष्ठावान् वैज्ञानिक प्रो० सतीश धवन का जन्म २५ सितम्बर १६२० को श्रीनगर कश्मीर मे हुआ।

बाल्यकाल एव शिक्षा—

सन् १६३६ मे राजकीय विद्यालय लुधियाना एव लाहौर मे गणित एव भौतिकी विषय लकर स्नातक, १६४१ मे पजाब विश्वविद्यालय चडीगढ से अग्रेजी विषय लेकर एम ए. तथा १६४४ मे मैकेनिकल इञ्जीनियरिग की उपाधि प्रथम श्रेणी मे प्राप्त की। एरोनाटिकल इञ्जीनियरिग की उच्च शिक्षा प्राप्त करने के लिए भारत सरकार से छात्रवृति लेकर अमेरिका के 'मिनेसोटा' विश्व-विद्यालय मे १६४६-४७ तक अध्ययन किया। १६४६ मे एयरोडायमिक्स का विशेष अध्ययन करके एयरोनाटिकल इञ्जीनियर्स तथा १६५१ मे एयरोनाटिक्स एव गणित में पी-एच. डी. की उपाधि प्राप्त की।

कार्य क्षेत्र

सन् १६५१ में अमेरिका से भारत लौटने पर सर्व प्रथम भारतीय विज्ञान सस्थान बगलौर के एयरोनाटिकल इञ्जीनियरिंग विभाग मे वरिष्ठ वैज्ञानिक अधिकारी, सन् १६५२-५५ तक असिस्टैण्ट प्रोफेसर, सन् १६५५-६२ तक अध्यक्ष तथा सन् १६६३ से भारतीय विज्ञान सस्थान के निदेशक के रूप में कार्य किया।

आपने अनेक रिसर्च पेपर लिखे है जिन मे तरल पदार्थ की यात्रिकी और एयरोनाटिकल इञ्जीनियरिग विशेषकर तीव्रगति वाली समस्याओ, सीमा सतह, ट्रान्सोनिक तथा सुपरसोनिक सुरंगो, क्षुब्धता, सक्रमण प्रपच आदि की जानकारी से अवगत कर या है।

आप रायल एरोनाटिकल सोसायटी एवं भारतीय विज्ञान अकादमी के फेलो, भारतीय एयरोनाटिकल सोसायटी, फिजिकल रिसर्च लैबो-रेटरी मैनेजमेट कौसिल, इण्डियन नेशनल कमेटी स्पेस रिसर्च, एटामिक एनर्जी कमीशन, बोर्ड आफ पोस्ट ग्रेजुएट इञ्जीनियरिग एण्ड रिसर्च आफ आल इण्डिया कौंसिल फार टेक्निकल एजूकेशन तथा इण्डो-सोवियत ज्वाइन्ट कमेटी फार साइटि-फिक क्वापरेशन के सदस्य है।

१० मई १९७२ को भारतीय अन्तरिक्ष अनुसंधान सगठन और सोवियत अकादमी आफ सांइसेस के बीच आर्य भट्ट के प्रक्षेपण के समझौते पर हस्ताक्षर हुए और इसी वर्ष उपग्रह निर्माण का कार्य बगलौर मे भारतीय अन्तरिक्ष अनुसधान सगठन के अध्यक्ष होने के नाते आपकी देख-रेख मे प्रारम्भ हुआ। उपग्रह आर्य भट्ट के प्रक्षेपण कार्य में दत्तचित हो गये।

सन् १९७३ मे पहला रोहिणी राकेट छोड़ा गया और एक वर्ष बाद भारत और सोवियत सघ में माडल उपग्रह का परीक्षण किया गया। दो महीने बाद परीक्षण माडल को सोवियत सघ ले जाया गया।

आर्य भट्ट की उपलब्धियों से प्रेरणा लेकर अधिक परिश्रम के बाद आपके नेतृत्व मे वैज्ञानिको ने आर्य भट्ट नामक उपग्रह दिवंगत आर्यभट्ट की जन्म शताब्दि पर प्रक्षेपण कर १९ अप्रैल १९७५ को आर्य भट्ट को सदा-सदा के लिए अमर कर दिया। उसी दिन भारतीय उपग्रह आर्य भट्ट ने लगभग ३० हजार किलोमीटर प्रति घण्टे को गति से परिक्रमा करना प्रारम्भ कर दिया।

यह सफलता भारत सोवियत मैत्री का ही फल है। जिस पर न केवल उक्त दो राष्ट्र ही प्रसन्न है अपितु विश्व आनन्दित हो उठा। इस महान कार्य के इतने शीघ्र सम्पन्न करने का श्रेय भारतीय अन्तरिक्ष शोध सगठन के अध्यक्ष प्रो० सतीश धवन को है।

आप को भारत के राष्ट्रपति ने सन् १९६६ मे पद्म श्री एव १९७१ मे पद्म भूषण तथा २८ मार्च १९८१ को पद्म विभूषण से विभूषित किया।

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वैदिक काल में वनस्पति विज्ञान क्षेत्र में सराहनीय प्रगति दृष्टिगोचर होती है। पौधों के वर्गीकरण, वाह्य तथा आंतरिक रचना, क्रिया विज्ञान तथा विकास का वर्णन वैदिक साहित्य मे मिलता है। ऋग्वेद में प्रकाशसंश्लेषण की ओर भी संकेत किया गया है। ऐसे प्रमाण मिलते है जिनसे पता लगता है कि उस काल के लोग भूमि को अधिक उपजाऊ बनाने के लिए फसलों का हेर फेर करते तथा खाद डालते थे। उस दूरस्थ समय में भी इस प्रकार के अध्ययन तथा तर्कणाप्रधान चिन्तन के लिए कोई भी हमारे पूर्वजों को प्रशंसा किये बिना नहीं रह सकता।

विज्ञान भी धर्म है

—डॉ० गंगाराम गर्ग

प्राय ऐसा माना जाता हैं कि विज्ञान और धर्म एक दूसरे के विरोधी हैं। यह अकसर सुनने का मिलता है कि वैज्ञानिक प्रगति और उसके द्वारा प्राप्त भौतिक समृद्धि ने मनुष्य को धर्म से विमुख कर दिया है। पर यदि थोडी-सी गम्भीरता से विचार करे तो प्रतीत होगा कि जो कार्य धर्म करता आया है और अब कर रहा है विज्ञान भी वही कार्य कर रहा है।

हम धर्म द्वारा ईश्वर के स्वरूप और उसके गुणो को जानने का प्रयत्न करते हैं। हमारे धार्मिक ग्रन्थो मे ईश्वर की एक ऐसे विराट् पुरुष के रूप में कल्पना की गई है, जो इस सम्पूर्ण ब्रह्माण्ड पर आच्छादित है। हमारे दार्शनिको ने अपनी अलौकिक प्रतिभा और कल्पना का परिचय दिया है और ईश्वर के सम्बन्ध मे हमारे चिन्तन को इस सीमा तक पहुचा दिया है कि कई बार तो ऐसा लगता है कि उसमे आगे सोचने को रहा कुछ नही है। अब यह देखिए कि प्रयोगशाला मे बैठा वैज्ञानिक क्या करता है। वस्तुतः हम कितनी भी कल्पना करे और कितना भी चिन्तन करे हम ईश्वर के सही स्वरूप को नही समझ सकते, क्योंकि कल्पना से वास्तविकता बडी होती है। हमने हाथी नही देखा पर कल्पना की कि हाथी एक विशालकाय जानवर है, पर हाथी देखने पर ही हमारा ज्ञान परिपूर्ण होता है। ईश्वर के सम्बन्ध मे भी हमे कल्पना से नही बल्कि वास्तविकता से काम लेना चाहिए। आज हमारे बीच कालिदास, शेक्सपियर, महर्षि दयानन्द सरस्वती और महात्मा गांधी नही हैं। यदि हम यह जनना चाहते हैं कि ये महापुरुष कैसे थे, तो हमारे पास एक ही मार्ग है कि हम उनकी रचनाओं को पढे और उनके स्वरूप को समझें। इसके अतिरिक्त हमारे पास कोई दूसरा मार्ग नही है। ईश्वर को हम अपनी भौतिक आँखो से नही देख सकते। हमारे सामने ईश्वर द्वारा रचित सृष्टि है, जिसे हम देख रहे हैं। ऐसी अवस्था में ईश्वर को समझने का यही एक मार्ग है कि हम उसकी सृष्टि को समझे। उसको समझे बिना हम ईश्वर के स्वरूप को नही समझ सकते। कल्पना हमारी सहायक हो सकती है पर उससे बड़ी वास्तविकता है जो हमे निश्चित मार्ग पर ले जा सकती है। प्रयोगशाला मे बैठा वैज्ञानिक जब अपनी खुर्दबीन या दूरबीन से क्षुद्र से क्षुद्र और दूर से दूर ससार को देखता है, वह भी तो उस ईश्वर द्वारा रचित सृष्टि को निहार रहा है। वह देखकर चौंक उठता है और उसके मुख से निकल जाता है कि ईश्वर तू कितना महान् है। वस्तुतः वैज्ञानिक कल्पना के आधार पर नही, बल्कि वास्तविकता के आधार पर ईश्वर की खोज कर रहा है। इस दृष्टि से दार्शनिक, भक्त और वैज्ञानिक मे कोई अन्तर नही है। सभी उस प्रभु के स्वरूप का चिन्तन कर रहे है। बल्कि एक दृष्टि से तो वैज्ञानिक का स्तर दार्शनिक और भक्त से ऊँचा है क्योकि उसका आधार कल्पना नही वास्तविकता है। जब एक वनस्पति विज्ञान का पंडित

किसी पौधे की रचना देखता है कि किस प्रकार पौधा जल, वायु और मिट्टी से भोजन लेता है कि और कितने छोटे-छोटे तन्तु उसमे कार्य कर रहे हैं, तो वह उस ईश्वर को महानतम वैज्ञानिक समझने लगता है। यही आधार दूरबीन से देखने वाले वैज्ञानिक का है, जो अरबों खरबो आकाश गंगाओ को देखकर उस प्रभु के महान स्वरूप की कल्पना करता है। एक दार्शनिक या भक्त की अपेक्षा वैज्ञानिक का सृष्टिकर्ता के प्रति प्रेम अधिक पुष्ट है क्योकि उसने अपनी आखो से उस प्रभु की विचित्र लीला को देखा है। हम प्राय. भजन गाते है कि ईश्वर तू महान है। तूने भाति-भाति के फूल बनाये। फूलो मे तूने गध डाली है। सूर्य और चद्रमा को चमक प्रदान की। यह तो भक्ति है, जो धर्म का आवश्यक अग है, पर जो व्यक्ति इस बात की खोज कर रहा है कि ये भाति-भाति के फूल कैसे बन गये, और फूलो मे गध कहा से आ गई और यह सूर्य मे चमक कहा से आ गई, वह और भी बडा भक्त है।

इस सम्बन्ध मे आर्य समाज के प्रवर्तक महर्षि दयानन्द का दृष्टिकोण भी विचारणीय है। ऋग्वेदादि भाष्य भूमिका के चतुर्थ अध्याय मे वेदो मे कौन-कौन से विषय किस-किस प्रकार के है, इस विषय पर महर्षि दयानन्द लिखते है कि वैसे तो वेदों मे अवयव विषय अनेक है, परन्तु उन मे से चार प्रमुख है — १– विज्ञान अर्थात् सब प्रकार के पदार्थो का यथार्थ जानना। २– कर्म, ३– उपासना और ४–ज्ञान।

विज्ञान उसको कहते है कि जो कर्म, उपासना और ज्ञान इन तीनो से यथावत् उपयोग लेना और परमेश्वर से लेकर तृण पर्यन्त पदार्थों का साक्षातबोध होना उससे यथावत् उपयोग का करना। इससे यह विषय इन चारो मे प्रधान है। विज्ञान के भी महर्षि ने दो भाग किये है। एक तो ईश्वर का यथावत् ज्ञान और उसकी आज्ञा का बराबर पालन करना और दूसरा यह है कि उस के रचे हुए सब पदार्थों के गुणो को यथावत् विचार करके उनसे कार्य सिद्ध करना अर्थात् ईश्वर ने कौन-कौन पदार्थ किस-किस प्रयोग के लिए रचे है। अत. महर्षि ने ज्ञान, कर्म और उपासना को विज्ञान की प्राप्ति के लिए साधन माना है और विज्ञान के अन्तर्गत पहले सृष्टि का ज्ञान और फिर सृष्टिकर्ता का ज्ञान माना है। इस प्रकार विज्ञान और धर्म को विज्ञान के ही अन्तर्गत माना है।

दीन-दुखियो की सेवा करना, निर्धनो की सहायता करना यह भी धर्म का अग माना जाता है। लोग तालाब खुदवाते हैं, प्याऊ बैठाते है, भूखो को अन्न वितरित करते है, क्योकि इससे पुण्य की प्राप्ति मानी गई है। यदि विज्ञान की सहायता से हम दरिद्रता को दूर कर सके तो क्या यह भी धर्म का एक अग नही माना जाएगा? बिजली ने लोगो को कितने आराम पहुँचाये है और यदि बिजली चली जाये तो कितना कष्ट होता है। अमरीका, रूस आदि पाश्चात्य देशो ने विज्ञान के बल पर ही अपनी निर्धनता को दूर किया है और वे ससार के शिखर पर पहुच गये है। विज्ञान की सहायता से बडे-बडे भयकर रोगो को दूर किया जा रहा है। क्या यह सब कुछ धर्म नही है? साथ ही जो सुविधाए आज विज्ञान ने मनुष्य को प्रदान की हैं, वे इतनी है कि उनकी गणना नही की जा सकती है। पहले एक जुलाहा अपने दो हाथो से बहुत थोडा कपडा बुन पाता था पर अब मशीन की सहायता से उसकी आय काफी बढ गई है। विज्ञान की सहायता से यह

प्रभृति प्रत्येक दिशा में दिखाई दे रही है। हमारी निर्धनता का मूल कारण यह है कि सीमित ऊर्जा के कारण हम उत्पादन उतना नही कर पाते कि हम प्रत्येक को उसकी आवश्यकता के अनुसार दे सके। विज्ञान ऐसी खोज मे प्रयत्नशील है जबकि आपको मनचाही ऊर्जा मिल सकेगी और उत्पादन भी लगभग असीमित हो जायेगा। निर्धनता समाप्त हो जायेगी। यह भी एक महान धर्म है।

अभी तक हमारी शक्तियाँ इस पर लगी रहती है कि हम किस प्रकार अपना और अपने परिवार का पालन पोषण कर सके। विज्ञान की सहायता से हमारी भौतिक आवश्यकताए थोडी देर ही कार्य करके पूरा हो जायेगी और शेष समय हम ललित कलाओ के अध्ययन मे या अनुसधान मे लगा सकते है। यदि ऐसी स्थिति आ जाए तो एक ही वर्ष मे हम इतनी उपलब्धिया प्राप्त कर सकेगे, जो हमे सैकडो वर्षो मे अब प्राप्त होती है।

हमारा सम्पूर्ण प्राचीन साहित्य विज्ञान की आधारशिला पर स्थित है। वस्तुत प्राचीन समय मे विज्ञान और धर्म मे अन्तर था ही नही। महर्षि दयानन्द ने वेदो का भाष्य लिखने से पूर्व चतुर्वेद विषय सूची बनाई थी। इस सूची को देखने से पता चलता है कि लगभग ७० प्रतिशत मन्त्र विज्ञान-परक भी है। वेद हमारे धर्म के स्रोत है और जब उनके अधिकाश मन्त्र विज्ञान-परक है तो विज्ञान और धर्म मे अन्तर क्यो? रामायणकाल मे भी विज्ञान ने काफी उन्नति कर ली थी। पुष्पक विमान का तो स्पष्ट उल्लेख है, जिसमें बैठकर राम लका से अयोध्या लौटे थे। दण्डकारण्य मे राम लक्ष्मण को ले जाते समय विश्वामित्र ने राम को ५५ प्रकार के अस्त्र-शस्त्र प्रदान किये थे। महाभारत युद्ध मे कितने भयकर अस्त्रो का प्रयोग हुआ है, यह सब जानते हैं। भागवत मे शाल्व राजा के उस विमान का उल्लेख है, जो भूमि, आकाश, जल और पहाडो पर भी आसानी से चल सकता था भरद्वाज ऋषि की अशुबोधनी नामक पुस्तक मे अनेक विद्याओ के लिए एक-एक अधिकरण है। विमान अधिकरण से वायुयान का बिजली, वायु, अग्नि, सूर्य-किरणे, चुम्बक आदि आठ पदार्थो से चलने का पता लगता है। ये वायुयान दूर-दूर के ग्रहो और लोको मे भी जाते थे। हिन्दू पुराण शास्त्रो मे विष्णु का वाहन गरुड माना है। इसका केवल यह अर्थ है कि विष्णु गरुड के आकार के विमान पर यात्रा करते थे। इसी प्रकार गणेश का वाहन चूहा है। इसका भी यही अर्थ है कि गणेश का वाहन चूहे के आकार का था। हमने वैज्ञानिक अनुसधान कर्ताओ को भी ऋषि माना है। 'अशुबोधनी' के लेखक भरद्वाज को हमने ऋषि माना है। कहा जाता है कि ऋषि भरद्वाज की एक बडी भारी प्रयोगशाला थी, जो कि इलाहाबाद के पास थी। आज के युग मे आइस्टाइन, रमन और सतीश धवन भी ऋषि है।

आज का और आने वाला युग ऊर्जा के बिना नही टिक सकता। मनुष्य जब अपने हाथो से कार्य करता है, तो वह शारीरिक ऊर्जा का प्रयोग करता है। जब वह मशीन पर कार्य करता है, तो मशीन भी किसी ऊर्जा के सहारे चलती है। सब को पता है कि पैट्रोल और कोयले के भडार सीमित है। पैट्रोल तो इस शताब्दी के बाद समाप्त सा हो जायेगा। कोयले के भडार सैकडो वर्ष चल सकते है पर ये दोनो पदार्थ वायु-प्रदूषण पैदा करते है। आवश्यकता इस बात की है कि हम इस प्रकार की ऊर्जा का पता लगाये, जो

वायु-प्रदूषण भी न करे और कम लागत पर पर्याप्त मात्रा मे मिलती रहे । वायु, जल समुद्र की लहरो, भूगर्भ, अग्नि, और सूर्य की गर्मी से ऊर्जा पैदा की जा सकती है । सूर्य की गर्मी से इस पृथ्वी पर जीवन है पर इसका ईंधन समाप्त होने मे नही आ रहा है । आवश्यकता इस बात की है कि हम सूर्य के निरन्तर जलते हुए रहस्य को समझे और फिर असीमित ऊर्जा प्राप्त करे ताकि हम अपनी निर्धनता को पूर्णतः समाप्त करके इस पृथ्वी को स्वर्ग बना सके । काम बहुत बडा है पर विज्ञान की उपलब्धि के बाहर नही है । क्या भारत का या किसी और देश का वैज्ञानिक इस ओर प्रयत्न कर सकेगा ? भले ही हमे एकदम सफलता न प्राप्त हो पर धीरे-धीरे हम उस ओर अवश्य पहुच जायेंगे जहां हम पृथ्वी पर से ऊर्जा की समस्या को सदा के लिए समाप्त कर सके । इस समय न तो पर्याप्त बिजली है, न डीजल है और न पेट्रोल । सभी चीजों को कमी है । ऊर्जा के स्थायी स्रोत के पता लगने पर पृथ्वी पर ही वह स्वर्ग आ जायेगा जिसकी लाखो वर्षों से मनुष्य स्वप्न लेते आ रहा है । विज्ञान धर्म ही नही बल्कि परम धर्म है । विज्ञान की असाधारण प्रगति को देखकर आशका हो जाती है कि मनुष्य जाति भयकर अस्त्रो से अपना अस्तित्व ही कही समाप्त न कर ले । यहा पर फिर हमे विज्ञान से ही शिक्षा मिल सकती है । इस ब्रह्माण्ड मे अरबो-खरबो लोक हैं और एक-एक लोक का घेरा करोडो मील है पर वे आपस मे टकरा कर अपना सर्वनाश नही कर लेते । सहअस्तित्व की भावना का हमे अपने मनो मे विकास करना होगा । वैदिक धर्म का सार यह है कि मनुष्य इस ससार मे ईश्वर द्वारा रचे गये पदार्थो का खूब उपभोग करे पर अपनी सुबुद्धि को बनाये रखे । गायत्री मन्त्र का भी यही सार है ।

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भारत की विपुल वन सम्पदा की पुराने युग से ही अत्यधिक गीत गाये गये हैं । वन भारतीय सस्कृति के उद्गम स्थान थे। उन वनों के एकान्त वातावरण में ऋषि-मुनियों ने प्रसिद्ध शास्त्रों और दर्शनों की रचना की । परन्तु रामायण और महाभारत जैसे महाकाव्यों में दंडकारण्य, नन्दनवन और खाण्डव वनों का इतना वर्णन होने पर भी हमारा ज्ञान उनकी वन सम्पदा के बारे में सीमित है।

पेलिनोलाजी और इस के उपयोग

—डा० पुरुषोत्तम कौशिक

परागकण (पालन ग्रेन) और बीजाणु (स्पोर्ज) के ग्रध्ययन को पेलिनोलाजी कहते है। पराग-कण ग्रनावृतबीजी (जिम्नास्पर्मज) और ग्रावृतबीजो (एन्जयोस्पर्मज) पौधो मे बनते हैं। पेलिनोलाजो शब्द की रचना एक ग्रीक भाषा के शब्द से हुई जिसका ग्रर्थ होता है दूर दूर फैलना। ये परागकणों और बीजाणुग्रो के दूर दूर बिखरने के सन्दर्भ में है। परागकण गोल या ग्रण्डाकार ग्राकृतियों के होते हैं। इनके बारे में प्राय कहा जाता है कि इनका जन्म पुंकेसर के परागकोष में होता है और मृत्यु ग्रण्डप (कारपल) ग्रथवा स्त्री बोजाणुपर्ण (मेगास्पोरोफिल) के वर्तिकाग्र पर होती है। परागकणों की इस यात्रा को परागकण कहते हैं। स्पष्ट है कि परागकणों का हमारे लिये उतना ही महत्व हैं जितना कि फलों और बीजों का। पेलिनोलाजी की ग्राधुनिक जानकारी का श्रेय स्वीडन के प्रोफेसर गुन्नर एर्डटमन को है। भारत मे भी डाक्टर पी० के० के० नायर, डाक्टर मिथिलेश चतुर्वेदी तथा ग्रन्य शोध कर्ताग्रो ने इस क्षेत्र में महत्वपूर्ण कार्य किया है।

प्रथम इण्डियन पेलिनोलाजिकल कॉंग्रेस पंजाब विश्वविद्यालय, चन्डीगढ के वनस्पति विभाग में सन् १९७४ में हुई। इसका फाउन्डेशन लैक्चर "इवॉल्यूशन ग्रॉफ स्पोर थ्रू दी एजज़" विषय पर प्रोफेसर पी० एन० मेहरा ने दिया।

ऐतिहासिक दृष्टि से परागकण (पालन ग्रेन) का उपयोग बहुत पुराना है। पुराने भारतीय ग्रन्थों मे ताज़गी लाने वाले पराग स्नान का वर्णन है। कहते हैं कि भगवान शंकर ग्रमलतास के पराग से भगवान विष्णु को स्नान कराते थे और फिर उनके सिर पर गंगाजल बरसाते थे।

चुड़ारत्व धरलसा चूर्ण स्नपनं विधायते पूर्वं।
रंगे-शपावुके त्वामभिषिञ्चसि मौलिगंग्या
शम्भुः ॥

पेलिनोलाजी का उपयोग निम्नलिखित बातों के लिये किया जा सकता है।

फसलों के ग्रच्छे बीज बनाने के लिये:— पालन की स्टोर करने की विधियाँ, उनकी वायबिलिटी के बारे में तथा ग्रन्य उपयोगी जानकारी प्लान्ट ब्रीडिंग प्रोग्रामों में बडी लाभकारी रहती है। हरियाणा कृषि विश्वविद्यालय, हिसार में डाक्टर वरघोज़ तथा उनके साथियों ने सरसों के बीजों को ०.२५ प्रतिशत, ०.५ प्रतिशत तथा १.० प्रतिशत कोलचिसीन में ग्राठ, बारह ग्रोर चौवीस घन्टेतक भिगोकर पानी से साफ करके उगाया। इन प्रयोगों से वे पालन स्टैराइल सरसों के पोधे बना सके। पालन स्टरिलिटि हाईब्रिड बीजबनाने के लिये बड़ी महत्वपूर्ण है।

मधुमक्खी पालन उद्योग में:— मधुमक्खियों के मुख के भागो पर और उनी टॉगों के तीसरे जोड़े पर लगे बास्केट्स पर चिपके पालन ग्रेन के अध्ययन से यह जानकारी मिलती है कि ये किन–किन तरह के फूलों और पौधों से शहद इकाट्ठा करने जाते हैं। रबड रिसर्च इन्सटीट्यूट ऑफ इन्डिया, कोटायम (केरल) के वैज्ञानिक जयरथनम ने रबड़ के पेड़ों पर लगे छत्तो की मधुमक्खियों के मुख और टागो पर परागकण न मिलने पर सिद्ध क्रिया कि मधु फूलो से नही अपितु पत्ते के डन्ठल पर लगी ग्रन्थि से एकत्रित किया हैं।

फारेंसिक विज्ञान मे—पेलिनोलाजी अपराधियो को पकड़ने में भी सहायता करती है। एक बार इस प्रकार का समाचार था कि इग्लेंड मे स्मगलिग का गेहूँ पकड़ा गया। यह मालूम करना असम्भव हो गया कि गेहूँ आया कहाँ से था ? बोरियों में गेहूँ के साथ लगे मुख्यता प्रोटियेसि के पालन और साथ मिले यूकेलिपटस और अकेसिया के पत्तों के टुकड़ों का अध्ययन करके, पॅलिनोलाजिस्ट यह बता सके कि गेहूँ आस्ट्रेलिया से आया था।

फार्मको पेलिनोलाजी— हेफीवर तथा अस्थमा पालन ग्रेन्स और स्पोर्स से होता हे। पेलिनोलाजी का ज्ञान इन बिमारियो मे तथा एलर्जी वाली कुछ बीमारियों का अध्ययन करने में काम आता है।

भूगर्भ में तेल तथा कोयले के तलाश करने में.— स्पोर्स के बारे मे जानकारी तेल की तथा कोयले की खानों को खोजने में लाभकारी है।

वर्गीकरण:— पौधों के वर्गीकरण मे भी पेलिनोलाजी बडो सहायक है।

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चन्द्रगुप्त मौर्य के समय में एक वन अधिकारी होता था। उसकी सहायता के लिये कई अन्य कर्मचारी थे। अशोक महान् ने राज मार्गों के दोनों ओर वृक्ष लगाने पर विशेष बल दिया। मुग़ल सम्राट वनों का आखेट के लिये संरक्षण करते थे और बाग तथा, उद्यान में रुचि रखते थे।

सूर्य से ऊर्जा

—डा० अमिताभ सिन्हा

वर्तमान समय में ऊर्जा की समस्या विश्वव्यापी बन चुकी है। ऊर्जा किसी भी देश की प्रगति के लिये आवश्यक है। विकसित या अविकसित सभी देशों की आर्थिक अवस्था की उन्नति के लिये इस का महत्वपूर्ण योगदान होता है। कारखानो के चलाने मे, सिचाई के लिये, यातायात के साधनो में तथा और भी अनेक कार्यों मे इसका प्रयोग होता हैं।

ऊर्जा के उद्‌गमो मे निम्नलिखित प्रधान है। कोयला, तेल (मिट्टी का तेल, पेट्रोल, डीजल आदि), प्राकृतिक गैस, जल–विद्युत शक्ति और परमाणु-ऊर्जा। इनमे में से तेल का प्रयोग अधिक होता है। परन्तु तेल के मूल्यों की बहुत अधिक वृद्धि के कारण आज प्राय: सभी विकसित एवं अविकसित देशों मे वस्तुओं के मूल्यो मे वृद्धि हुई हैं। इसी कारण आज ऊर्जा के नये साधनो के लिये अनुसन्धान कार्य पर गम्भीर रूप से विचार किया जा रहा है। इस सन्दर्भ में सूर्य से प्राप्त ऊर्जा मनुष्य के लिये बहुत उपयोगी सिद्ध हो सकती है। पृथ्वी को सूर्य से ऊर्जा की प्राप्ति निरन्तर रूप से होती है। विश्व के कोयला, तेल आदि के भण्डार भविष्य मे समाप्त हो जायेगे, परन्तु सौर ऊर्जा मानव को मिलती ही रहेगी।

सूर्य से प्राप्त ऊर्जा के और भी कई लाभ हैं। इसे बहुत ही साफ ऊर्जा स्रोत माना जाता हैं क्योंकि यह वातावरण को दूषित नही करता। कोयला जलाने से या तेल प्रयोग करने से जो गैस उत्पन्न होते हैं वह विकट रूप से वातावरण को दूषित करते हैं। बड़े नगरो में तो यह समस्या गंभीर रूप लेने लगी है। वातावरण के दूषित होने से जनसाधारण के स्वास्थ्य पर बुरा प्रभाव पड़ता है। परमाणु–ऊर्जा साधारणतः यूरेनियम, प्लूटोनियम आदि से प्राप्त होती है। इसके प्रयोग के लिये बहुत ही सावधानी की आवश्यकता है क्योंकि यदि व्यक्ति देर तक इससे सीधे सम्पर्क मे रहे तो उसकी मृत्यु भी हो सकती है। इसके अतिरिक्त परमाणु–ऊर्जा का प्रयोग यदि युद्धों मे आरम्भ हो जाये तो समस्त मानव जाति के समाप्त हो जाने की सम्भावना है। इसलिये जिन देशो को इसके प्रयोग की विधि का ज्ञान है वह दूसरे देशों को इस दिशा में मदद करने में उत्सुक नही है। आतंकवादियो को यदि किसी प्रकार से पर्याप्त मात्रा मे इन पदार्थों की प्राप्ति हो जाती है तो वह किसी भी देश के लिये घातक सिद्ध हो सकते हैं। इसके अतिरिक्त तेल की भाँति इन के भन्डार भी विश्व मे सीमित मात्रा में ही है। इन सभी तथ्यो पर विचार करने पर सूर्य से प्राप्तऊर्जा एक अत्यन्त उपयोगी ऊर्जा स्रोत प्रतीत होता है।

आज प्राय: सभी विकसित देशों में सूर्य से प्राप्त ऊर्जा के उपयोग करने की विधियों पर अनुसन्धान कार्य पर बहुत प्रयास किया जा रहा है।

भारत में भी इस दिशा में कार्य प्रारम्भ हो गया है। भारत के लिए तो सौर ऊर्जा वरदान ही सिद्ध होगी क्योंकि यहां अधिकांश क्षेत्रों मे समस्त वर्ष सूर्य की किरणें पर्याप्त मात्रा मे पहुंचती है। यदि वे शीतप्रधान देश, जहाँ वर्ष के अधिकांश समय सूर्य की किरणें कम ही मिलती हैं, सूर्य की ऊर्जा का उपयोग कर सकते हैं तो भारत जैसे देश के लिए तो यह अनिवार्य हो होना चाहिए। ग्रामो के लिए यह बहुत लाभदायक होगा क्योंकि एक स्थान से दूसरे स्थान तक पहुँचाने के लिए बिजली के लम्बे तारों की आवश्यकता नही रहेगी। इस के लिए सिलिकोन अर्धचालक संगमों का प्रयोग किया जाता है जिन्हें तकनीकी भाषा में सोलर सैल कहते हैं। इसमें सूर्य की किरणों को विद्युत ऊर्जा में परिवर्तित कर दिया जाता है। तदुपरान्त इस विद्युत ऊर्जा से पम्प भी चलाये जा सकते हैं जो कि धरती से जल निकालकर सिचाई के काम आ सकते हैं।

इस प्रकार सूर्य से प्राप्त ऊर्जा का उपयोग करना किसी भी देश के लिए लाभदायक सिद्ध हो सकता है।

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वृक्षारोपण

धरती के उपजाऊपन को कायम रखो, बढ़ाओ, वृक्षारोपण करो, अपरदन को अब दूर भगाओ। शिव की भाँति जहर पी कर जो अमृत बरसाते हैं उन्हें उगाकर आज प्रदूषण से छुटकारा पाओ। हरे भरे नाना रंग वाले पेड़ों से भूमि सजाओ, मिले सभी कुछ जिन वृक्षों से उनको शीश झुकाओ।

—फारिग

अरे यह क्या ?

—डॉ० वी० शंकर

कल तलक फुरसत न मिलती थी
रसोई से जिन्हें,
आज वह आज़ाद हैं कुछ
गुन-गुनाने के लिये।
चन्द मिनटों में रसोई का
निबट जाता है काम।
अब नहीं कहती है वह
मिलता नहीं उनको आराम ।।

१९४५ की एक शाम। स्थान है वाल्थम (उत्तरी अमरीका) मे स्थित रेथियन कम्पनी की प्रयोगशाला। एक वैज्ञानिक रडार वैकुअम नलिका के पास रख देता है। कुछ ही क्षण बीते होगे कि उस व्यक्ति की निगाह चाक्लेट के टुकड़े पर पडती है। वह विस्मित होता है। चाकलेट का टुकडा हलुआ जैसा मुलायम हो गया है। यह व्यक्ति है पर्सी स्पेन्सर। इस घटना चक्र से स्पेन्सर का मस्तिष्क तेजी से काम करता है। वह मक्का के कुछ दाने और एक अण्डा मगाता है। दानों को वह रडार के एन्टीना के सामने रखता है। अरे यह क्या ? दाने नाचते है और शीघ्र ही फूल की तरह खिल उठते हैं। जैसे भाड़ मे भूनने पर हो जाते है। अब वह अण्डे को रडार के हार्न के पास रखता है। अण्डा बम की तरह फूट पड़ता है।

इन घटनाओ के विश्लेषण से एक जबरदस्त तथ्य उभर कर सामने आया है। वैज्ञानिक ने यह निष्कर्ष निकाला कि रेडियो तरंगे या माइक्रोवेव खाना पकाने के काम आ सकती है।

आज माइक्रोवेव द्वारा सुअर के गोश्त की एक स्लाइस को केवल एक मिनिट में पकाया जा सकता है। इसी प्रकार आलू को भूनने मे केवल चार मिनिट लगेगे। माइक्रोवेव का चूल्हा टैलीविजन सैट की तरह दीखता है। इस चूल्हे मे अनेक खूबिया हैं—इससे रसोई गर्म नही होती, बर्तन धोने का काम कम और आसान हो जाता है, ऊर्जा की बचत होती है और खाना बहुत तेजी से पकता है। इन तरगो द्वारा भोजन, कागज, प्लास्टिक, शीशे या चीनी पर पकाया जा सकता है। माइक्रोवेब द्वारा पकाये गये भोजन मे उसका प्राकृतिक रग बना रहता है और उसकी सुगन्ध बढ जाती है। चूल्हे को साफ करना बहुत आसान है। भीगे कपड़े से पोछना भर काफी होता है। ऐसा इसलिए है क्योकि भोजन चूल्हे की दीवारों पर चिपकता नही। माइक्रोवेव से खाना पकाने मे ऊर्जा बेकार बिल्कुल नही जाती क्योंकि माइक्रोवेव की प्राय: सारी की सारी ऊर्जा सीधी भोजन मे जाती है।

भोजन पकाने के लिए आग की खोज के बाद माइक्रोवेव का भोजन पकाने के लिए उपयोग सबसे बडी खोज है। वह दिन दूर नही जब यह

तरंग आज के प्रचलित खाना पकाने के साधनों, जैसे गैस, बिजली, लकड़ी और कोयले के चूल्हो, पीछे छोड देगी।

अब प्रश्न यह है कि माइक्रोवेव भोजन को इतनी जल्दी कैसे पकाती है ? तो सुनिये। आप जरा अपनी हथेलियो को तेजी से रगडिये। आप देखते हैं कि उष्मा पैदा होती है और हथेली गर्म हो जाती है। बिल्कुल इसी प्रकार माइक्रोवेव भोजन पर प्रभाव करती है। भोजन के अन्दर प्रवेश करने पर माइक्रोवेव नमी के कणो मे तीव्र कम्पन पैदा करती है–यह कण एक सैकन्ड में २ अरब ४५ करोड बार कम्पन करते है। कम्पन से पैदा होने वाली रगड़ से भोजन गरम हो जाता है। इस तरह हम देखते हैं कि माइक्रोवेव सीधा भोजन मे ऊष्मा नहीं पहुंचाती है। पहले यह भोजन मे तुरन्त जज्ब हो जाती है और फिर वहाँ ऊष्मा पैदा करती है। यह तरगे उन तरंगों से मिलती जुलती है जो टेलीविजन और रेडियो स्टेशनो से प्रसारित की जाती है। माइक्रोवेव ऊर्जा की तरग है।

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भारतीय वनों की वैज्ञानिक व्यवस्था के लिए पहला ठोस कदम तत्कालीन वायसराय लार्ड डलहोजी ने भारत सरकार के तीन अगस्त, १८५५ के मेमोरेन्डम द्वारा उठाया था। इस मे उल्लिखित था कि वनों का संहार इस प्रकार नहीं किया जाना चाहिए जिससे कि वे नष्ट हों।

भारतीय वन अनुसंधान की स्थापना सन् १९०६ मे हुई।

आर्यभट्ट–भास्कर–रोहिणी

प्रो० विजयेन्द्र कुमार

आर्यभट्ट, भास्कर, रोहिणी इन नामों की संसार मे बड़ी चर्चा हुई है। ये भारत के द्वारा अन्तरिक्ष मे विभिन्न उपयोगो के लिए भेजे गये उपग्रहों के नाम हैं। जबकि हमारे द्वारा फेकी हुई कोई वस्तु थोड़ा ऊपर ही जाकर लौट आती है ऐसी स्थिति में ये जटिल मशोने इतना ऊपर जाकर अपना कार्य किस प्रकार करती हैं इसे हम निम्न प्रकार समझ सकते है।

पृथ्वी के आकर्षण के कारण पृथ्वीतल से आकाश की ओर फेकी वस्तु पुन.नीचे चली आती है। यदि फेकने का वेग बढाते जाये तो फेकी गयी वस्तु के द्वारा प्राप्त ऊँचाई भी बढती जाती है। इसी प्रकार यदि कोई पिंड किसी ऊँचे स्थान से क्षितिज दिशा मे प्रक्षिप्त की जाय तो कुछ देर बाद मे फेके गये स्थान से कुछ क्षितिज दूरी पर गिर पड़ता है। इस स्थिति मे भी प्रक्षेक वेग बढाने पर प्रक्षिप्त द्वारा प्राप्त क्षितिज दूरी बढती जाती है। इस तरह यदि किसी पिड को किसी ऊचे स्थान से आठ किलोमीटर प्रतिसेकिन्ड का वेग देकर प्रक्षिप्त किया जाय तो पिंड पृथ्वी पर नही गिरेगा। वह पृथ्वी के चारो ओर एक कक्षा मे परिक्रमण करने लगेगा। यह वेगेगणितज्ञो ने गणना से ज्ञात किया है।

अब यह समस्या हुई कि किसी पिंड को इतना वेग किस प्रकार प्रदान किया जाये। सामान्य साधनो से यह सभव नही है। इसके लिए जेट प्रणाली का उपयोग किया गया है।

किसी बर्तन मे भरे द्रव या गैस के एक बहुत छोटे छिद्र से होकर तीव्र गति से बाहर निकलने की क्रिया को 'जेट' कहते है। जिस वस्तु मे से निकलता है वह वस्तु यदि चलने को स्वतत्र है तो विपरीत दिशामे चलने लगती है। इस प्रकार से किसी वस्तु को गति कराने को जैट प्रोपलजन कहते हैं।

इसी प्रक्रिया से जैट हवाई जहाज उड़ते है। वायु तथा रासायनिक मिश्रण के जलने से गर्म गैसे बनती है जो बहुत तेजी से फैलती हैं। ये गैसे जहाज के पिछले भाग से बड़ी तेजी से बाहर निकलती हैं। परिणाम स्वरूप जहाज विपरीत दिशा मे अर्थात् आगे की दिशा मे गति करता है।

जेट जैसा ही राकेट प्रोपलजन भी होता है। राकेट प्रोपलजन मे राकेट का वेग अधिक नीव्र गति से बढता है। इसका कारण यह है कि राकेट का द्रव्यमान कम होता रहता है।

कृत्रिम उपग्रह (अतरिक्ष मे अनुसधान के लिऐ भेजी जाने वाली मशीन) को कक्षा में स्थापित करने के लिए एक से अधिक राकेटों को मिलाकर बने हुए बहुक्रम राकेट की सहायता ली जाती है।

सबसे पहले कार्य करने वाला राकेट सब से बड़ा तथा सबसे भारी होता है। अन्तिम क्रम का राकेट सबसे हल्का होता है। सबसे पहले प्रथम क्रम के राकेट का इजन कार्य करना प्रारम्भ करता है। ईंधन समाप्त होने पर यह स्वय शेष भाग से पृथक हो जाता है और दूसरे क्रम का इजन काय प्रारम्भ कर देता है। अत में अतिम क्रम का इंजन कार्य करना आरम्भ करता है उसी से कृत्रिय उपग्रह को कक्षा मे गति करने के लिए आवश्यक वेग प्राप्त होता है।

कृत्रिम उपग्रह की चाल तथा परिक्रमणकाल (एक परिक्रमा मे लगने वाला समय) उपग्रह की पृथ्वी तल से ऊंचाई के अनुसार होते है। पृथ्वी के समीप परिक्रमा करने वाले उपग्रह की चाल लगभग आठ किलोमीटर प्रति सेकेन्ड तथा परिक्रमण काल लगभग ऐक घन्टा चौबीस मिनट होता है।

कुछ दिन पूर्व तक कृत्रिम उपग्रह छोडने की क्षमता केवल पाँच देश रखते थे। इन देशों के नाम हैं रूस, अमेरिका, फ्रांस, जापान तथा चीन। अब भारत भी उपग्रह छोडने वाले देशो में सम्मिलित हो गया है। आर्य भट्ट' तथा 'भास्कर' के पश्चात् इस दिशा में नवीनतम सफलता 'रोहिणी' नाम के उपग्रह की स्थापना करके भारत ने प्राप्त की है।

'रोहिणी' उपग्रह १८ जुलाई १९८० को भारतीय अंतरिक्ष अनुसंधान संगठन के श्री हरिकोटा केन्द्र से प्रक्षिप्त किया गया था। इस उपग्रह का वजन ३५ किलोग्राम था इस उपग्रह का परिक्रमण काल ९० मिनट है। इस उपग्रह को कक्षा में स्थापित करने वाले राकेट की गति ४४०५०६० कि० मीटर प्रतिघटा थी। इस राकेट ने 'रोहिणी' उपग्रह को कक्षा मे स्थापित करने का कार्य केवल८ मिनट में ही पूरा कर लिया था।

कृत्रिम उपग्रहों से प्राप्त जानकारियाँ भविष्य में बहुत उपयोगी सिद्ध होगी। मौसत की पूर्व सूचना प्राप्त करके आने वाले खतरे (तूफान, आदि) से सतर्क होकर उससे होने वाले विनाश को कम से कम किया जा सकता है। अन्तरिक्ष अनुसधान का उपयोग जलयानों तथा वायुयानो के लिए किन्हीं दो स्थानो के बीच सबसे कम लम्बा रास्ता निर्धारित करने में भी हो सकेगा। इस प्रकार समय और ऊर्जा की बचत होने से भारी आर्थिक लाभ होगा। टेलीफोन बातचीत की प्रचलित प्रणाली मे बहुत तारो की आवश्यकता होती है। आने वाले समय मे इसमे और वृद्धि होगी लेकिन यदि उसके लिए संचार उपग्रहों का उपयोग किया जाय तो यह सस्ता और सुविधा जनक होगा।

भारत मे यह कार्य अभी प्रारभिक अवस्था मे है। लेकिन ऐसी आशा है कि थोडे से समय में ही हम इस दिशा मे बडी प्रगति कर लेगे।

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प्राचीन वाङ्मय में वैज्ञानिक तत्त्व

—प्रो० जयदेव

मैक्समूलर ने अपने ग्रन्थ "भारत हमे क्या सिखाता है" मे वेदों को विश्व पुस्तकालयो की सर्व प्रथम पुस्तक अगीकार किया है। वेदो में किस प्रकार का ज्ञान है? इस विषय को लेकर एक लम्बे काल से विवाद की स्थिति बनी हुई है। मान्यता चाहे प्राचीन हो और चाहे अर्वाचीन हो हमे सत्य की खोज करनी चाहिए। हमे कोई तथ्य इ। लिए स्वीकार करना है कि उसे प्राचीन काल से माना जाता रहा है, यह वैज्ञानिकता अथवा सत्य अन्वेषण की विधि नही मानी जा सकती है। परन्तु इस के साथ ही यह मान्यता उससे भी अधिक खडन करने योग्य है कि यह मान लिया जाय कि जो कुछ प्राचीन साहित्य मे है वह किसी भी अवस्था मे नही मानना है, चाहे कितना भी सत्य वैज्ञानिक तथ्य का प्रतिपादन क्यो न हो। जो भी शोध किया जाय वह तथ्य एव शुद्ध तर्क के आधार पर मान्य होना आपेक्षित है।

आज से लगभग दस वर्ष पूर्व की आधुनिक पुरातत्व वेत्ताओ की मान्यता के अनुसार इस ससार की समस्त गतिविधि एव इतिहास केवल १० हजार वर्ष से लेकर १५ हजार वर्ष से अधिक पुराना नही माना जाता था। जब उन विद्वानो को यह कहा जाता था कि भारतीय गणित और वैदिक आधार पर विश्व की रचना एव उसका इतिहास लगभग दो अरब वर्ष पुराना है तो वे विद्वान् मखौल उडाते थे। परन्तु आधुनिक नवीनतम आविष्कार एव वैज्ञानिक निष्कर्षों ने उस मखौल का मखौल यह खोज कर के कर दिया कि सृष्टि का इतिहास दो ही नही अपितु लगभग तीन अरब वर्ष पुराना है। अभी इस वर्ष पूर्व की मान्यता कि एक मनव पिञ्जर की हड्डियो का रासायनिक विश्लेषण करने से वह दो करोड वर्ष पुराना सिद्ध हुआ है। चन्द्रमा से लाया गया एक पत्थर का टुकडा तीन या इस से भी अधिक अरब वर्ष पुराना विश्व की वैज्ञानिक प्रयोगशालाओ ने माना था।

उपर्युक्त निष्कर्षों से यह स्वत सिद्ध हो जाता है कि मानव क सास्कृतिक एव साहित्यिक इतिहास हजारो वर्ष नही अपितु करोडो वर्ष पुराना है।

इस तथ्य के मानने पर अब क्या यह सही हो सकता है कि मनुष्य करोडो वर्षों तक मूर्ख रहा है और वह केवल कुछ सौ वर्षो से ही बुद्धिमान बना है। वस्तुत सत्य तथ्य यह है कि मानव इतिहास मे सैकडो बार नही अपितु लाखों बार विकास एव ह्रास की स्थिति आई है। विकास की चरम सीमा के पश्चात् भयंकर युद्ध एव प्राकृतिक घटनाओ से अनेकों बार विश्व

खंडहर बना, फिर विकास हुआ और उसके पश्चात् पतन। इस क्रम मे मानव इस समय विकास की चरम सीमा की स्थिति मे से गुजर रहा है। यह विकास की स्थिति बनी रहे, वैज्ञानिक उपलब्धिया जीवित रहे और मानव सभ्यता का पुन. पतन न हो, इस चिन्ता मे आज मानव समाज शास्त्री, दार्शनिक एव बुद्धिजीवी वर्ग अत्यन्त घुल रहा है। निशास्त्रीकरण एव विश्व सरकार का गठन आदि की भावनाये इस उपर्युक्त तथ्य के परिणाम एव निष्कर्ष है ? परन्तु क्या ये उदात्त भावनाये एव मान्यताये विश्व को विनाश से बचा सकेगी ? किस के सामने यह प्रश्नवाचक चिह्न नही है ? इसका वैज्ञानिक एव दार्शनिक तथा यथार्थ उत्तर एक ही है कि इस चरमोत्कर्ष वैज्ञानिक युग का अन्त फिर वही बैलगाडी घरो मे तेल का दीपक, शिकार के लिए पत्थर एव लोहे के नुकीले शस्त्र और तीर कमान होगे। निरुक्तकार ने आज से हजारों वर्षो पूर्व वैज्ञानिक खोज की थी कि विश्व के प्रत्येक पदार्थ की छः गति होती है। अस्तित्वरूप, उत्पन्न, बढ़ना, विपरिणाम, क्षयत्व और विनाश।

इस उपर्युक्त निष्कर्ष के आधार पर यह मानना उचित है कि वैज्ञानिक उन्नति भी अनेको बार मानव इतिहास मे हुई होगी और पुन वे लुप्त हो गई हैं। विज्ञान की समस्त शाखाओ का वर्णन हमारे प्राचीन ग्रन्थो मे उपलब्ध है। यहां विमानो का वर्णन प्रस्तुत है।

वेदो के मन्त्रो में जिस प्रकार के विमानो का वर्णन मिलता है, उसका विस्तार एव शोध करके भरद्वाज मुनि ने ५६ प्रकार के विमानो के नाम अपने ग्रथ "यत्र सर्वस्व" मे गिनाये है। यह ग्रन्थ बृहद् विमान शास्त्र के नाम से स्व० स्वामी ब्रह्ममुनि ने प्रकाशित कराया है।

इन विमानों के कुछ नाम इस प्रकार है – भैरव, नन्दन, वटुक विरिञ्चि, तुम्बर, वनतेय भेरुण्ड-मकरध्वज शृ गरक, अम्बरीष सैहिक, मातृक गरुडास्य, गजास्य, वसुदेव, सूरसेन बीरबाहु शुकतुण्ड, जम्बुक, गिरीश, कुमुंद, क्रौञ्चिक, अजगर, पचदल दुन्दुभि मायूरक, रविमण्डन, व्याघ्रमुख, विष्णुरथ, सौवर्णिक, बृहत्, कुञ्ज, महानट और ककुम इत्यादि।

रामायण काल का बहुचर्चित "पुष्पक" विमान का नाम आता है। जब राम को रावण के साथ युद्ध मे विलम्ब हो गया था, उस समय उनको पुष्पक नामक विमान से अयोध्या ले जाया गया था। वह अत्यन्त आराम के साधनो से युक्त बताया जाता है। इसे कुछ भ्रान्त विद्वान् गप्प कह कर उपेक्षा कर देते है। परन्तु यहा तो द्वापर में एक पुष्पक ही नहीं अपितु ५६ प्रकार के विमान थे।

विमान के निर्माण मे किस प्रकार की धातु या लोहादि होना अपेक्षित है, इस का वर्णन भी विस्तार पूर्वक प्राप्त होता है। उसका वर्णन इस प्रकार प्राप्त है कि — क्ष्विङ्का-लोह विशेष या जस्ता, पाषाण चूर्ण, कान्ति कृष्ण लोह, वज्र, अभ्रक, कमठा, शिलारस, डिम्भारि, घोण्टा मैन-फल, कर तरवर शुल्व-त म्ब, विरञ्चि, कर्ण अर्क मन्दार पारा, धतूरा, सुरञ्जी, कासादि। इन उपर्युक्त वस्तुओ का समान भाग लेकर विधिवत् तीन बार शुद्ध करके शशभूषार्म मुखपात्र मे भर दे। मण्डूक कुण्ड के मध्य में रख कर पञ्चास्य मस्त्रिका से २०० दर्जे की उष्णता से धौक कर नेत्रपर्यन्त गला कर उस रस को लेकर शीघ्र यन्त्र के मुख मे विधि से डाल दें। इस विधि से पुष्टि वर्धक नीलवर्ण अत्यन्त सूक्ष्म सुदृढ भार रहित भास्वर वैडालिक लोहे का निर्माण हो जायेगा।

वायुयान में किस प्रकार का लौहा उपयोग में लाया जाय जिस पर तापमान एवं अन्य वाता-वरण का प्रभाव न हो, उस को बनाने की उपर्युक्त विधि है।

उस समय विमानो मे एक विद्युम दर्पण लगता था जिसकी निर्माण विधि इस प्रकार बत-लाई गई है। उस गोपुर यन्त्र का वेग विद्युत से उत्पन्न अग्नि के वेग को पूर्ण रूप से अति वेग से खीचकर स्वयं पी लेता है। पश्चात् सूर्य किरण शक्तियां अपने तेज से गोपुस्थ दारुण उस शक्ति को लेकर महामाडलिक वात मण्डल मे आकाश के अन्दर विलीन कर देती है। पुन उस शक्ति का विनाश हो जाता है। पश्चात् वह हिम की भाँति अत्यन्त शीतल हो जावे। उससे विमान यान मे बैठे चालक यात्रियो को सन्तोष एव सुख प्राप्त होना चाहिये। तथा विमान भी सुरक्षित रहें। अत. विमान में शास्त्र विधि से इसे अद्-भुत स्थिर विद्युत दर्पण नामक यन्त्र को सस्था-पित करे।

विमान मे एक ही नही अपितु इस प्रकार १२ विद्युत दर्पण यन्त्रो को लगाने का विधान प्राप्त है।

मूल संहितायो मे जिस प्रकार के वायुयानो का सकेत प्राप्त है, वे विमान एक देश से दूसरे देश और लोक-लोकान्तरों में जाने वाले विमान भी बतलाये गये है।

विभिन्न प्रकार की सवारियो या यानों से हमारा भूमि, जल और आकाश मे प्रतिदिन सुविधापूर्वक आना जाना है वे यान लोहा, ताम्बा और चान्दी आदि तीत धातुओ से निर्मित होती है। जैसे नगर या ग्राम की गलियो मे झटपट जाना आना होता है, वैसे ही दूर देश मे भी उन सवारियों से शीघ्र-२ जाना आना होता है। ये यान सभी दुर्गम और दूर स्थानों में जाने वाले होते हैं। ये जो अग्नि युक्त यान निर्मित होते है वे बड़े२ समुद्रों के मध्य से भी पार पहुंचने में समर्थ होते है। इन पृथ्वी, जल और आकाश में चलने वाले यानों में वाष्प वेग के लिये एक जलाशय बनाकर उसमें जल से चैक करना चाहिये ताकि वे अत्यन्त तीव्र गति से सुख पूर्वक चलने वाला सिद्ध हो सकें।

ये विमान मन के वेग समान चलने वाले हो इन यानो मे तीन प्रकार के पहिये हो, जिन से जल और पृथ्वी के ऊपर चलाया जा सके। उनमें तीन-तीन थम्बे ऐसे बनाने चाहिये कि जिन के आधार पर कला यन्त्र लगे रहे ये थम्भें काष्ठ या लोहे के साथ लगे रहें। सभी पुर्जे इस प्रकार स्थिर रहें कि कभी उन में कोई विकार न पाये और ये सवारियो को सुख पूर्वक ले जा सके।

इसी प्रकार यानो का वर्णन विभिन्न रूप से किया है कि समुद्र, भूमि और आकाश मे चलने वाले यानों का निर्माण करना चाहिये। इन यानो के बाहर भी थम्भे रचने चाहिए जिन मे सभी प्रकार के कलायन्त्र लगाये जाने चाहिये। उन मे से एक चक्र ऐसा बनाना चाहिये जिसके घुमाने से सभी यन्त्र ओत-प्रोत होकर घूम सके। उनमे तीन-तीन सौ बडो-बडी कले अर्थात् पेंच लगते है, जिनसे उसकी यान सभी मशीने जुड जाये। ६० कला यन्त्र होने अपेक्षित है, कुछ चलते रहे और कुछ बन्द रहें। जब विमान ऊपर चढाना हो तब उस भाप स्थान का मुख बन्द करना अपेक्षित हैं। अतः इसमे सभी ऊपर नीचे, बाये दायें, वापिस चलने के यन्त्र लगाने चाहिये।

वेदो में सेकड़ों स्थानो पर विमान शब्द या यान, नाव आदि शब्दो का प्रयोग है। इतना अवश्य सिद्ध होता है कि विमान विद्या के ज्ञान के साथ-साथ उस समय के ऋषि आध्यात्मिकता परित्याग नही करते थे जैसा कि कहा गया है कि महर्षि भारद्वाज द्वारा वेद का निर्मंथन कर यन्त्र सर्वत्र ग्रन्थ को मक्खन के रूप मे निकाल कर रखा है। इस "यन्त्र सर्वस्व" मे वैमानिक प्रकरण ५०० सूत्रो मे एव आठ अध्यायो मे निबद्ध है। इनमे त्रिपुर नामक वायुयान पृथ्वी, जल और आकाश मे समान रूप मे चलने वाला माना है। विमान के ३२ प्रकार रहस्य बतलाये गये है जैसे विमान का अदृश्यकरण, शब्द प्रसारण, लङ्घनु रूपाकर्षण, शब्दाकर्षण, शत्रुओ पर धूम प्रसारण, शत्रु सेब चाने को स्वविमान का मेघवृत करना, दूर से आते हुए शत्रु के विमान पर ४०८० ताड़ो फैंक कर उड़ने मे असमर्थ करना, शत्रु सेना पर शब्द बम फेंकना आदि का प्रयोग विमानों द्वारा करने का वर्णन मिलना है। इसी प्रकार विमान की १२ गतियों का वर्णन मिलता है।

अत वैदिक वाङ्मय मे जहा दर्शन और अन्य गुह्य विद्याओ का व्याख्यान हुआ है, वहा भौतिक विद्या और विज्ञान का भी वर्णन प्रचुर रूप में मिलता है। जहा अनेक प्रकार की विधियाँ विमान आदि के निर्माण की क्रमशः मिलती हो वहाँ ये सब कल्पनाऐ है ऐसा कहना इस साहित्य के साथ अन्याय होगा।

वास्तव मे इस प्राचीन तकनीकी विद्या का आधुनिक परिपेक्ष्य मे सरकार को आज के वैज्ञानिक और वैदिक वाङ्मय के विद्वानो का एक शोध शाला बनानी चाहिये, हो सकता है वैकल्पिक विमान निर्माण विधि का अविष्कार हो सके और इस भारतीय निधि का उचित उपयोग किया जा सके।

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संसार का पहला मनुष्य जो यूरोप की धरती से ऊपर उड़ा सेन्टा--ड्यूमांट था। इस घटना से प्रभावित होकर ब्रिटिश सवादाता लार्ड नार्थक्लिफ ने कहा था समाचार यह नहीं है कि मनुष्य उड़ निकला हैं, बल्कि यह है कि इंग्लैण्ड अब द्वीप नहीं रहा।

क्या पेड़-पौधे भी सोचते हैं ?

राजेश चौहान

सुप्रसिद्धि वैज्ञानिक सर जगदीश चन्द्र वसु को ही सर्वप्रथम यह सिद्ध करने का गौरव प्राप्त है कि पौधे भी सचेतन हैं अर्थात् वे भी मनुष्य की भाँति सोचते हैं, विचार करते है और उनमे चातुर्य का भी विशेष समन्वय पाया जाता है। उन्होने ही सर्वप्रथम यह सिद्ध किया की मनुष्य को भाँति ही पेड-पौधे भी स्वसन क्रिया करते हैं तथा जीवित कोशिकाओं से मिलकर बने होते हैं। मनुष्य के समान ही सुख-दुख को उन्हे भो अनुभूति होती है। उनकी इस खोज ने वनस्पति विज्ञान मे हलचल मचा दी और विश्व के अनेक वैज्ञानिको का इस ओर ध्यान आकर्षित हुआ तो उन्हें और भी आश्चय जनक प्रमाण मालूम हुए।

पेड-पौधों की विचार शक्ति के रूप में अनेकों उदाहरण दिये जा सकते है। ऐसे अनेक पेड-पौधे हैं जो अपने पास आने पर छोटे-छोटे कीड़ों को अपनी विशेष रचनाओ के द्वारा पकड लेते हैं, और धीरे-धीरे उनको शोषित कर लेतें है, यह वनस्पति विज्ञान का एक अत्यन्त मनोरजक भाग है। सर चार्ल्स डार्विन ने इन पौधो के बारे मे अनेक अन्वेषण किये और "इन्सेक्टोवोरस प्लाँट्स" नामक एक पुस्तक लिखी। ये पौधे संसार के विभिन्न स्थानो पर पाये जाते है और कीडों से अपना खाद्य प्राप्त कर लेते है। वैसे तो "फोटोसिथेसिस" द्वारा भी इनका खाद्य संश्लेषण चलता रहता है। ऐसे पौधों के कुछ उदाहरण हैं जैसे–नैपेन्थीस, सिफैलोटोरस, सारासीनिया, डारलिंगटोनिया, ड्रौसेरा, युट्रिकुलेरिया इत्यादि।

अब आप की मुलाकात एक ऐसे छोटे से पौधे से कराते हैं जिसे "लिनेरिया" कहा जाता है। इन महोदय को पथरीली चट्टानो पर निवास करने का शौक है। इन्हें यदि चट्टान में कोई छेद दिखायी दे जाये तो ये अपनी जड़ों को उस छेद मैं जमाकर, चाट्टान पर अपने शरीर को फैलाकर, परिस्थितियो से जीवन-सघर्ष करते हुए अपना जीवन व्यतीत करतें हैं। जब यह महोदय अपनी बाल्यावास्था को पारकर अपनी वयस्कावस्था मे कदम रखते हैं तो इन्हे अपनी वशवृद्धि का ख्याल आता हैं, तब यह अपनी शाखाओ पर रगबिरगे फूल खिला देते है। मधुमक्खियां पराग की खोज मे मचलती हुई, इन पर आकर बैठती है तो लिनेरिया महोदय के नर भाग में बने पराग कण इनसे चिपक जाते हैं और जब ये मादा भाग पर आकर बैठती हैं तो ये परागकण मादा भाग मे बने अण्डे से सयोग करते हैं। इस प्रेक्रिया के परिणाम स्वरूप बीज बन जाता है। अब ये बीज वायु मे उडकर दूसरी चट्टानो के छेद में गिर जाते हैं तथा अनुकुल परिस्थियाँ पाकर फिर से नये लिनेरिया शिशु को जन्म देते है जो समय पाकर वयस्क हो जाता है।

युकेलिप्टस का पेड़ तो आपने अवश्य देखा

होगा परन्तु इनकी विचार शक्ति से आप शायद परिचित न हो तो, इन महाशय के विषय में भी जान लें। यह पेड किसी भी स्थान पर क्यों न उगे अपनी जडों को फैलाना हुआ उस स्थान तक ले जाता है जहाँ पर उसे पानी मिल सके। पानी काफी गहराई पर होने पर इसकी जोड धरती मे सैकड़ों फिट तक चली जाती है।

जिस प्रकार से मनुष्य के शत्रु होते हैं और वह अपनी रक्षा के उपाय सोच लेता है उसी प्रकार सुन्दर फूलों से युक्त पेड़-पौधों का नुकीले काटे या दुर्गन्ध युक्त होना उनकी रक्षा भावना से ही परिचालित प्रतीत होता है।

पौधों में मनुष्य के समान उत्तेजन शीलता का गुण भी पाया जाता है। छुई-मुई नामक पौधे को तो आपने अवश्य देखा होगा। छूने पर इसके पत्ते मुरझा जाते हैं। पौधे यद्यपि स्थिर रहते हैं तब भी उनमें गति होती है, उदाहरणार्थ–सूरजमुखी के फूल का सूर्य की ओर घूमना गति का ही उदाहरण है। खट्टी बूटी तथा कचनार की पत्तियाँ दिन में तो खिली रहती हैं, परन्तु रात में बन्द हो जाती हैं। उपर्युक्त विवेचन से हम निष्कर्ष निकालते हैं कि पौधो में भी जीव जन्तुओं की भाति जीवद्रव्य, जनन, उत्तेजन शीलता, श्वसन, उपापचय, वृद्धि, गति, अनुकूलन सचेतनता आदि विशेषताएँ पायी जाती है। अतएव हम कह सकते हैं, पौधे भी चेतन हैं, वे भी सोचते हैं, अनुभव करते है।

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'अनुसंधान' ऐसा शब्द है जिसका काफी उपयोग व दुरुपयोग होता है। वस्तुतः यह–और कुछ नहीं, एक मनः स्थिति है—परिवर्तन का स्वागत करने की मनः स्थिति। यह विगत काल का विवेचन नहीं भविष्य पर विचार करना है। अनुसंधान को, अज्ञात को, पाने के लिए एक 'जुआ' अथवा गेरिला युद्ध भी कहा गया है। अनुसंधान में हमें परीक्षा और हर्ष नैराश्य और विनोद का साक्षात्कार होता है। —डा० वाई० नायुडम्मा

एक वैज्ञानिक पक्ष—

व्यक्तित्व

भूपेन्द्रकुमार मेहता

संसार में कोई भी दो मानव प्रत्येक दृष्टि से पूर्णतया समान नहीं हो सकते। शिशु से बालक, बालक से किशोर तथा किशोर से वयस्क एव वयस्क से प्रौढ व प्रौढ से वृद्धावस्था तक मानव अन्य प्राणी से अधिकाधिक भिन्न होता चला जाता है। शारीरिक तन्तुओं के निर्माण व सश्लेषण की प्रक्रिया जिस प्रकार भ्रूण स्थापना से ही प्रारम्भ होती है, ठीक इसी के समान्तर निरन्तर व्यक्तित्व विकास प्रणाली भी अपना कार्य प्रारम्भ कर देती है, जन्म के तुरन्त पश्चात से लगभग ५ वर्ष तक दोनों प्रक्रियाये साथ २ चलती हैं, तत्व-ज्ञान धीरे-धीरे वंशानुक्रम के आधार पर वातावरण से प्रभावित होकर यह निर्माण व विकास प्रक्रिया लगभग २० वर्ष तक शारीरिक विकास के साथ ही पूर्ण हो चुकी होती है, इसके पश्चात् केवल परिपक्वता के अन्त का समावेश हो सभव है, इस अवस्था के बाद किसी व्यक्ति के व्यक्तित्व मे किसी नवीन कारक के प्रभाव से आकस्मिक परिवर्तन प्रायः कम ही देखा गया है।

सभी माता पिता की यह इच्छा होती है कि उनकी संतान स्वस्थ सुन्दर मेधावी हो, उसका व्यक्तित्व सार्वभौमिक हो। इसके लिए आवश्यक है कि इस समानान्तर विकास प्रक्रिया के प्रत्येक पग पर मनोवैज्ञानिक पक्ष के साथ समाहित वैज्ञानिक पक्ष को भी समझा जाय—

जीव विज्ञान के आधार पर बालक के व्यक्तित्व का निर्माण व विकास उसके शरीर की कोशिकाओं ने विद्यमान रचना 'जीन' से सम्बधित है। स्वय मे 'जीन' की रचना, सरचना, मौलिकता उसके वशानुक्रम तथा वातावरण से निर्धारित होती है, जो विकास की प्रारंभिक अवस्थाओं को अपेक्षाकृत अधिक प्रभावित करती है। 'जीन' मे में उपस्थित अन्य सूक्ष्म रसायन डी० एन० ए० तथा आर० एन० ए० व न्यूक्लिओटाइड की सख्या सरचना व्यवस्था तथा विशिष्ट श्रृंखला क्रम ही अन्ततः व्यक्तित्व का निर्धारण करती है। डी० एन० ए० तथा आर० एम० ए० जो कि मानव शरीर में उपस्थित कोषो के अत्यन्त सूक्ष्म भाग है वास्तव में अन्य सूक्ष्म रासायनिक पदार्थों, पेंटोज शर्करा फास्फेट्स तथा नाइट्रोजन बेस आदि से निर्मित है, जो कि अन्ततः C, H; N, G, O, P, आदि सामान्य परमाणुओ के पपस्पर विभिन्न प्रकार के समायोजनो के फलस्वरूप प्राप्त होते हैं।

इस प्रकार इन्ही परमाणुओ के मध्य विभिन्न बधो के निर्माण, विकास, समायोजन मे वंशानुक्रम, समय-समय पर ग्रहण किये गए खाद्य पदार्थ एव वातावरण, प्रत्येक क्षण पर महत्वपूर्ण भूमिका निर्वाह करता है।

वैज्ञानिक दृष्टि से देखा जाय तो खाद्य पदार्थ

इनके निर्माण के लिए प्रयुक्त सामग्री है व वातावरण इनके निर्माण हेतु ऊर्जा का स्रोत है। तथा वंशानुक्रम एक उत्प्रेरक है जो गति को अनुकूल दिशा दे सकता है।

प्रत्येक नर प्राणी के शुक्राणु में इसी कारण उस प्राणी के व्यक्तित्व के लगभग सभी विशिष्ट गुण विद्यमान होते हैं जो कि उसकी सन्तान में सक्रमित होते चलेजाते हैं। मादा प्राणी का शारीरिक स्वास्थ्य, सौष्ठवता व अन्य विशिष्टता भ्रूण विकास में केवल उर्वरक का ही कार्य कर पाती हैं।

दूसरी ओर वातावरण यह एक ऐसा गूढ़ विषय है, जिसका वैज्ञानिक विश्लेषण अभी तक नहीं हो सका है। इसका स्पष्ट प्रमाण है कि अन्तरिक्ष में उपस्थित प्रत्येक मानव प्रणाली तथा कुछ अन्य विशिष्ट वस्तुएँ अलग-अलग समय पर अपनी विभिन्न तथा विशिष्ट स्थिति में ऐसी अज्ञात आवृत्ति की तरंगे अथवा किरणे उत्सर्जित करते हैं या शोषित करते हैं, जिनका वैज्ञानिक अध्ययन अभी तक प्रारम्भ नहीं हो सका है। जिस प्रकार एक रेडियो अथवा टी० वी० में सुई घुमाने पर सचार केन्द्र द्वारा प्रसारित इच्छित आवृत्ति प्राप्त होने ही उस विशेष कार्यक्रम को सुना अथवा देखा जा सकता है इसी प्रकार मानव मस्तिष्क भी एक ऐसा जटिल इलैक्ट्रानिक उपकरण है, जिससे समय-समय पर शोषित अथवा उत्सर्जित विकिरणों को एक विशिष्ट दिशा मे ध्रुवित, केन्द्रित अथवा क्रम बद्ध करने पर इच्छित कार्य सिद्धि सभव है। समस्त मानव शरीर भी एक चुम्बक की भांति है, जिसका शीर्ष उत्तरी ध्रुव तथा पैर दक्षिणी ध्रुव का कार्य करते है जो अन्य किसी भी स्रोत से प्राप्त निकट के विकिरणों के साथ आकर्षण, प्रतिकर्षण, अवशोषण, उत्सर्जन, केन्द्रीयकरण, विकेन्द्रीयकरण प्रक्रिया सचालित करते रहते हैं। साधना, योग-साधना, पूजा, तपस्या, एकाग्रता, चिन्तन, मनन, आस्था, आशीर्वाद, स्वच्छता, सुसगति, चमत्कारिता, रीति रिवाज की आवश्यकता, अनावश्यकता का इसी आधार पर स्पष्टीकरण संभव है।

मानव की प्रत्येक क्रिया कुछ अशों मे इन विशिष्ट अदृश्य किरणों के परस्पर आपेक्षिक तथा समायोजित प्रभाव का परिणाम है ये शून्य किरणे लगातार शून्य में उपस्थित ग्रहो से, पृथ्वी पर स्थित विभिन्न जीवित या निर्जीव माडलों से अवशोषित अथवा उत्सर्जित होती हैं।

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संसार का सर्वप्रथम पुरुष जो हवा में उड़ा लुई का कोर्ट इतिहासकार पिलेटे डी रोजिअर था।

सांप

—तिलकराज सेठ

साँप का नाम सुनते ही मनुष्य के चेहरे पर भय की छाया आ जाती है। साँप सम्पूर्ण विश्व मे पाये जाते है और भारत मे भी इनकी सख्या कुछ कम नही है। साँप यद्यपि अनेक मनुष्यो की मृत्यु का कारण बनते है किन्तु देखा यह गया है कि उन में से पर्याप्त सख्या उन व्यक्तियों की होती है जो भय तथा अज्ञानता के कारण मर जाते है, साँप के काटने के कारण नही।

भारत मे पायी जाने वाली विषैले साँपो की जातियो मे मुख्य जातियाँ है – कोबरा, क्रेट, वाइपर, पिटवाइपर तथा समुद्री साँप। ये विषैली जातिया अविषैली जातियो से पूँछ तथा शरीर पर पाये जाने वाले स्केल्स को देखकर पहचानी जा सकती है। विषैले साँपो की विभिन्न जातिया यद्यपि रग-रूप, आकार, तथा रचना मे एक दूसरे से भिन्न होती है तो भी इन मे एक समानता अवश्य होती है और यह है इन में विष उपकरण का पाया जाना।

विष उपकरण –

प्रत्येक विषैले साँप के विष उपकरण मे सामान्यतया दो विष ग्रन्थिया होती है। ऊपरी जबाड़े के दोनो ओर आख से थोडा नीचे एक-एक विष ग्रन्थि पायी जाती है। इन ग्रन्थियो मे विष बनता है जिसे विष नलिका द्वारा विषैले दात (फंग) मे पहुंचाया जाता है। ये विषैले दात अन्दर से खोखले होते है और इनके सिरे पर एक छोटा छिद्र होता है। प्राय इन दातो की सख्या दो होती है और प्रत्येक दाँत के पीछे एक छोटा सुरक्षित दात रहता है जो पहले दात के टूट जाने पर आकार मे बडा हो जाता है और कार्य करने लग जाता है। साधारणतया विषैले दात साँप के मुख मे पीछे की ओर मुडे रहते है किन्तु जब साँप काटने के समय मुख खोलता है तो ये दाँत खोपडी की हड्डियो की सहायता से सीधे खडे हो जाते है। जब मुख मे मनुष्य के किसी भाग को पकड कर साँप अपना मुख बन्द करता है तो विष ग्रन्थियो पर दबाव पडता है और इनसे विष निकल कर दाँतो मे आ जाता है और दाँतो के सिरे पर उपस्थित छिद्रो से होता हुआ मनुष्य के घाव मे पहुच जाता है।

सर्प विष –

सर्प विष साँप की विष ग्रन्थियो का कार्बनिक स्राव होता है। इसका रग हल्का पीला होता है तथा इस मे कोई स्वाद या गन्ध नही होती। इस मे कार्बनिक अम्ल मे घुली हुई ३० प्रतिशत विषैली प्रोटीड पाई जाती है। सुखाये जाने पर यह विष छोटे-छोटे टुकडो मे बट जाता है जो पानी मे घुल जाते है। यह विष केवल कटे हुए भाग पर अपना प्रभाव डालता है। प्रत्येक साँप के विष मे अपनी विशेषता होती है, कोई श्वसन सस्थान पर प्रभाव डालता है तो कोई हृदय या तत्रिका सस्थान पर।

एन्टीवेनम –

आजकल साँप द्वारा काटे गये मनुष्य को एन्टीवेनम का टीका लगाया जाता है। प्रत्येक प्रकार के सर्प विष के लिए विशिष्ट टीका लगाया जाता है। हॉफकिन्स इन्सटीट्यूट, बाम्बे एन्टीवेनम के टीके तैयार करने मे देश को पर्याप्त योगदान दे रही है। एन्टीवेनम तैयार करने के लिए यहा घोडो को समय समय पर सर्प विष के टीके लगाये जाते हैं और हर बार टीके मे सर्प विष की मात्रा बढा दी जाती है। एक समय ऐसा आता है जब घोड़े पर विष की किसी भी मात्रा का कोई प्रभाव नही होता। अब घोडे के रक्त को निकाल कर उसका सिरम अलग कर लेते है। यह सिरम उस सर्प के लिए, जिसके विष के टीके घोडे को लगाये गये थे, विशिष्ट एण्टीवेनम का कार्य करता है।

भारत मे पायी जाने वाली मुख्य विषैली जातिया तथा उनके लक्षण नीचे दिए गए है।

कोबरा –

यह विषैला साँप प्राय: नाग कहलाता है। इस साँप की दस जातियाँ है। यह प्राय: सघन आबादी वाले भागो मे पाया जाता है और प्राय भूरा या काला होता है। इसकी लम्बाई लगभग ५॥ फीट तक होती है और सिर का भाग चौडा होकर फन बनाता है जिस पर विशेष प्रकार के चिह्न पाये जाते है। सिर से थोड़ा पीछे शरीर की अधर सतह पर दो काली धारिया पायी जाती है। इसको पूँछ गोल होती है तथा अधर सतह के स्केल्स पूरी अधर सतह के आकार के होते हैं। ऊपरी जबडे के किनारे पर पाये जाने वाले स्केल्स मे तीसरा स्केल ऑख तथा नासिका स्केल को छूता है। यह सर्प अत्याधिक विषैला होता है और मनुष्य के श्वसन सस्थान पर अपना प्रभाव डालता है।

क्रेट –

यह भी अत्यधिक विषैला साँप है और ३ से ५ फीट तक लम्बा होता है। इसकी पीठ काली होती है जिस पर चौडाई मे सफेद धारियाँ पायी जाती हैं। अधर सतह सफेद होती है। पीठ पर लम्बाई मे षटकोणीय स्केल्स की धारी पायी जाती है। यह रात्रिचर है तथा मेढक, चूहे आदि इसका मुख्य भोजन है। क्रेट की पूँछ गोल होती है और पूँछ की अधर सतह पर स्केल्स की केवल एक पक्ति होती है।

वाइपर –

वाइपर का आकार लगभग ५ फीट तक होता है। इसकी पीठ हल्की भूरी और अधर सतह पीले रग की होती है और अधर सतह पर गहरे रग के धब्बो की तीन धारियां। सिर पर इङ्गलिश के अक्षर 'वी' के आकार का सफेद चिह्न होता यह फुकार की आवाज भी देता है। वाइपर रात्रिचर है और प्राय. मैदानी क्षेत्रो मे पाया जाता है। इस का विष मनुष्य के हृदय तथा तन्त्रिका सस्थान पर अपना प्रभाव डालता है।

पिट वाइपर –

पिट वाइपर प्रायः पहाडी क्षेत्रो तक सीमित है। इसका आकार प्रायः २ से ३ फीट होता है, पीठ भूरी तथा अधर सतह सफेद होती है। यह वाइपर से इस बात मे भिन्न है कि इसकी आख तथा नासिका के बीच एक पिट (दबाव) पायी जाती है।

समुद्री साँप—

पानी मे पाये जाने वाले साँपो की मुख्य पहचान यह है कि इनकी पूंछ चपटी होती है जब कि स्थलीय साँपो की पूंछ गोल होती है। यह चपटी पूंछ साँप को पानी मे तैरने मे सहायक है। समुद्री साँप मासाहारी होते है तथा मछलियो को खाते है। समुद्री साँप अत्यधिक विषैले होते है।

अत हम देखते है कि साँपो की विभिन्न जातियो के अपने विशिष्ट लक्षण है जो उनकी पहचान कराने मे सहायक है। यदि थोडा ध्यान से देखा जाये तो पहचाना जा सकता है कि साँप विषैला है अथवा नही, और यदि विषैला है तो किस जाति का है। इस प्रकार का ज्ञान हो जाने पर मनुष्यो मे साँप के भय से हो जाने वाली मृत्यु को रोका जा सकता है और काटने वाले साँप की जाति का ज्ञान होने पर डॉक्टर को मनुष्य का उपचार करने में सुविधा होती है।

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ब्रह्माण्ड

विजेन्द्र कुमार

ब्रह्माण्ड की आयु ३०-८० अरब साल है तथा हमारा सूरज लगभग १० अरब साल पुराना है। हमारी वर्तमान पृथ्वी ५ अरब साल पुरानी है। पृथ्वी पर सबसे आदिम जीव २ अरब साल पहले पैदा हुआ था और मनुष्य का पृथ्वी पर अवतरण १०-२० लाख साल पहले हुआ था। खेती १० हजार साल से पुरानी नही है और लिपि की खोज लगभग ६ हजार साल पहले हुई थी।

पूरे ब्रह्माण्ड मे लगभग १९ अरब आकाश गंगाये हैं और हर आकाश गगा में १० अरब तारे हैं और एक औसत आकाश गगा का व्यास लगभग एक लाख प्रकाशवर्ष है। (एक प्रकाश-वर्ष वह लम्बाई होती है जितनी प्रकाश, १,८६,००० मील प्रति सेकण्ड की गति से एक वर्ष मे चलता है)।

आधुनिक औषधियां कितनी सुरक्षित ?

—लोकेश कुमार राले

साधारण सी सर्दी, खासी व अन्य छोटी मोटी बीमारियों के लिए आजकल ब्रॉडस्पेक्ट्रम एन्टीबायटिक्स, जो अधिकाश रोगो मे बिना निदान के भी लाभदायक होती है पर साथ ही वे विषाक्त भी बहुत हैं, बिना किसी सोच विचार के दे दी जाती है। किन्तु इसके भयकर दुष्परिणाम हो सकते हैं। एन्टीबायटिक्स मे तीव्रता अधिक होती है पर वे लाभ के साथ हानि भी पहुचा सकती है। इनका प्रभाव शरीर मे विष के समान घातक भी हो सकता है। पेनिसलीन, ए० टी० एस० आदि के विषाक्त प्रभाव के कारण मृत्यु के समाचार सर्व विदित है। औषधियो की योग्यता, अयोग्यता तथा प्रभाव क्षेत्र का निर्णय भी उनकी विषाक्तता के आधार पर किया जाता है ताकि कही वह औषधि जो कि किसी विशेष बीमारी या विशेष रोगाणुओं को सम्भावना से दे दी जा रही है इनकी अनुपस्थिति या रोगी की शारीरिक दुर्बलता या क्षीण प्रतिरोधात्मक क्षमता के कारण कोई अन्य विकार न उत्पन्न कर दे जिसका परिणाम जान लेवा भी हो सकता है। पेनिसलीन, क्लोरमफेनिकाल (क्लोरोमाइसिटीन), सल्फाथायजोल, सल्फानीलामाइड आदि के विषाक्त प्रभाव इसके ज्वलन्त उदाहरण है।

एन्टीबायटिक्स—

इनके बारे मे बहुत साधारण सी भाषा मे कहा जा सकता है कि ये एक जीव से प्राप्त वे द्रव्य है जो कि दूसरे जीवो की वृद्धि मे बाधक सिद्ध हो सकते है या उन्हे पूर्णतया नष्ट कर देते है। दूसरे जीवो से तात्पर्य रोगाणुओ और विषाणुओ से है। पाच दशक पूर्व जब एलेक्जेन्डर फ्लेमिंग ने पेनिसलीन की खोज की, तब से अब तक और विशेषकर पिछले तीन दशको मे कई नई और ज्यादा उपयोगी एन्टीबायटिक्स की खोज की जा चुकी है और यह खोज अब भी जारी है। पेनिसलीन–जी तथा प्रोकेन पेनिसलीन की जगह आज एपीसिलीन ने लेली है। जब प्रारम्भ मे इनके प्रभावों का अध्ययन किया गया तो इन्हे आश्चर्य एव प्राण रक्षक औषधि और न जाने किन-किन उपाधियो से विभूषित किया गया लेकिन बाद मे इन्ही एन्टीबायटिक्स के अनुपयुक्त व अविववेकशील उपयोग से इनके भयकर दुष्प्रभावो का पता चला।

पेनिसलीन, स्ट्रेप्टोमाइसिन आदि एन्टीबायटिक्स कुछ लोगो मे एलर्जी पैदा कर देती है। यह एलर्जी किसी भी रूप मे व्यक्त हो सकती है जैसे– शरीर, मुंह पर चकत्ते या दाने, खुजली, उल्टी, दस्त, अग विशेष मे शोथ इत्यादि। कई बार यह एलर्जी इतनी तीव्र हो जाती है कि शीघ्र ही उचित उपचार न किया जाये तो मृत्यु भी हो सकती है। गले सम्बन्धी तकलीफो के लिये अक्सर पेनिसलीन की गोलियां चूसने को दी जाती हैं जिससे मुह मे "कैंडिडा" नामक एक

फगस की वृद्धि हो जाती है तथा मुह से और जीभ पर सफेद परत सी जमने लगती है। स्ट्रेप्टोमाइसिन तपेदिक के लिये एक बहुचर्चित व प्रभावकारी औषधि है, महीनों तक इसके इजेक्शन दिये जाते हैं। लेकिन साथ ही स्ट्रेप्टोमाइसिन से मास पेशियो से दुर्बलता व पीडा तथा बहरापन तक प्रारम्भ हो जाता है। इसके अतिरिक्त जेंटामाइसिन, वायोमाइसिन इत्यादि एन्टीबायटिक्स से भी बहरापन हो जाता है। ग्राइसोफल्विन और इसी वर्ग की अन्य एन्टीबायटिक्स जो कि दाद जैसी फगस के लिये प्रयुक्त होती है, हाथों पैरों के नर्वस सिस्टम पर कुप्रभाव डालती है।

क्लोरमफेनिकाल (क्लोरोमाइसिटीन) सरीखी खतरनाक औषधि टाइफाइड ज्वर, इन्फ्लूएजल मेनिन्जाइटिस, क्रौनिक ब्रौंकाइटिस तथा कुछ मूल सम्बन्धी विकारो की उत्तम दवा है। चिकित्सक विशिष्ट अवस्थाओ मे ही सारी सावधानी बरतते हुए इसका प्रयोग करते है। इसकी विषाक्तता के कारण एक विशेष प्रकार का रक्त विकार हो जाता है जिसे प्लास्टिक अनीमिया कहते है, जिस मे रक्त के लाल कण प्राय. नष्ट हो जाते है। रोग अचिकित्स्य है तथा मृत्यु अवश्यभावी है। इसका अनुपयुक्त प्रयोग बौन मैरो को भी प्रभावित करता है जिससे शरीर पर एक घातक प्रहार होता है।

कुछ बच्चों के दाँत जन्म से ही अच्छे नही होते। इसका एक कारण माता द्वारा गर्भावस्था मे खायी गयी एन्टीबायटिक्स का कुप्रभाव है। दन्त विशेषज्ञों का विश्वास है कि प्रायः गर्भास्था के पहले व अन्तिम तीन महीनों मे औरतो को एन्टीबायटिक्स खिलाये जाते है जिसका प्रभाव यह होता कि उनके बच्चो के दाँत शुरु से ही कम जोर पड जाते हैं और दाँतो की की अनेक बीमारियो से शीघ्र ही ग्रस्त हो जाते हैं। इन विषाक्त प्रभावो को उत्पन्न करने मे टेट्रासायक लन वर्ग की एन्टीबायटिक्स का विशेष योगदान रहता है इसके अतिरिक्त इस वर्ग की एन्टीबायटिक्स से भूख में कमी, शरीर के भार मे कमी, नाखून पीले पडना आदि विकार उत्पन्न हो जाते है। एन्टीबायटिक्स इस अवस्था मे देना अनुचित नही कहा जा सकता लेकिन इन्हे तब ही दिया जाना चाहिये जब तक परम आवश्यक हो।

एनालजेसिक्स (पेन किलर्स)—

एसपिरीन (एसिटाइल सैलिरिलिक एसिड) सभी एनालजेसिक्स की एक मुख्य व आवश्यक अवयव है। इसकी मात्रा बाजार मे साधारणतया मिलने वाले एनालजेसिक्स मे १६० मिली ग्राम से लेकर ३८६ मिली ग्राम तक होती है। एसपिरीन एक अच्छी दर्द निवारक, एन्टी पायरेटिक (ज्वर कम करने वाली) और एन्टी इन्फ्लेमेटरी (शोथ कम करने वाली) दवा है यह अन्य इस प्रकार के गुणो वाली दवाओ से सस्ती और कम विषाक्त प्रभाव रखती है तथा ठीक ढंग से प्रयोग करने पर बहुत लाभदायक सिद्ध होती है। परन्तु अधिकतर एनालजेसिक्स और एन्टीपायरेटिक्स में एसपिरीन के साथ एक या ज्वादा दवाए और मिली होती है, ये दवाए प्रायः फिनेसिटीन, कैफीन, कोडीन सल्फेट आदि होती है। यह सिद्ध हो चुका है कि फिनेसिटीन, हीमोग्लोबीन पर कुप्रभाव डालती है और इससे कुछ लोगो मे हीमोलाइटिक एनीमिया भी हो सकता है। जिन लोगो मे एन्जाइम (ग्लूकोस–६ फास्फेट डिहाइड्रोजन) की

कमी होती है वे यदि इसका उपयोग कम भी करें तो भी इसके कुप्रभावो से ग्रस्त हो जाते हैं। इस बात के भी प्रमाण मिलें हैं कि इसके अधिक मात्रा में या ज्यादा समय तक के प्रयोग से वृक्क बहुत ही प्रभावित होते है और इससे मृत्यु तक भी हो सकती है। जो लोग पहले ही किसा वृक्क विकार से पीडित है उनके लिये यह और भी घातक सिद्ध होती है। इस बात का कोई प्रमाण नही है कि दो या दो से अधिक एनालजेसिक्स का मिश्रण एक एनालजेसिक्स से, सिर दर्द के लिये ज्यादा लाभप्रद हो। इसलिये फिनेसिटीन का एनालजेसिक्स मिश्रणों में डाला जाना कहां तक तर्क सगत है? कैफीन यद्यपि एनालजेसिक तीव्रता को नही बढाती फिर भी मानसिक व कुछ हद तक शारीरिक थकान को दूर करती है। परन्तु अधिकतर एनालजेसिक मे जितनी कैफीन होती है उससे कही ज्यादा एक कप तेज चाय या काफी से प्राप्त की जा सकती है। इसी प्रकार कोडीन सल्फेट जो कि खासी के प्रभाव को कम करती है और एनालजेसिक्स में दर्द कम करने के उद्देश्य से मिलाई जाती है, ज्यादातर मे १० मिलीग्राम से कम होती है। एक आदर्श एनालजेसिक मे फिनेसिटीन मुक्त एसपिरीन होनी चाहिए और यदि कैफीन या कोडीन मिलीं हो तो कम से कम ३० मिलीग्राम और १० मिलीग्राम होनी चाहिये। एसपिरीन जहा एक ओर आवश्यक व उचित प्रयोग से एक प्रभावशाली औषधि सिद्ध होती है वहां दूसरी ओर अनावश्यक व अधिक मात्रा में लेने से हाइपर एसिडिटी उत्पन्न कर देती है, पेट व आंतो से रक्तस्राव प्रारम्भ हो जाता है और पैप्टिक अलसर तक की स्थिति आ जाती है। इस अवस्था मे नोवल्जिन, प्रेडनीसोलोन एसपिरीन वर्जित है।

विटामिन व टानिक—

विटामिन ए नेत्र ज्योति तथा अस्थियों के लिए उपयोगी होता है परन्तु इसके अत्यधिक सेवन से तीन चार–मास में अस्थियो मे पीडा युक्त शोथ, अस्थियो का अनावश्यक विकास (विशेष कर बच्चो मे), भूख का न लगना, खुजली होठो पर पपडी बनना, शरीर की चमडी का फटना तथा बालों का झडना आदि लक्षण उत्पन्न होते है। विटामिन "के" तथा "सी" का अनावश्यक सेवन 'रक्त स्कन्दन' की क्रिया को हानि पहुंचाता है, आयरन युक्त गोलिया, कैप्सूल टॉनिक आदि आदि रक्ताल्पता की अच्छी दवाएं है पर आयरन अधिक होने पर शरीर से निष्कासित नही होता और आभ्यतरिक कोशिकाओ मे जमने लगता है, फलत ये कोशिकाए कडी होकर (फाइब्रोसिस) निष्क्रिय होने लगती है। आंतों की फाइब्रोसिस मृत्यु कारक हो जाती है। इसीप्रकार 'ए' के साथ विामिन 'बी' का अनुचित प्रयोग गुर्दे मे पथरी पैदा कर सकता है।

लिंग-निर्धारण

अवधेश कुमार अग्रवाल

मनुष्य के अस्तित्व के प्रारम्भ मे ही जीव दो प्रकार के जाने जाते हैं। एक नर तथा दूसरा मादा। मनुष्य ने सदा यह जानने की कोशिश की है कि होने वाला बच्चा नर होगा या मादा अरस्तू का अनुमान था कि यदि कन्सेपशन के समय हवा उत्तर की तरफ बहती है तो लडका होगा तथा यदि हवा दक्षिण की दिशा मे बहती है तो लड़की होगी। कुछ लोगों का विचार था कि दायें अण्डाशय मे नर तथा बाये मे मादा बनती है। किन्तु २० वी शताब्दी में ये सब अनुमान निराधार बताये गये क्योंकि तब आनुवांशिकी व वर्धन का ज्ञान हो चुका था वास्तव में अधिकतर जन्तुओ मे सेक्स उसी समय निश्चित हो जाता है जिस समय निषेचन होता है। और यह सब गुणसूत्र पर निर्भर करता है, जो अण्डे को माता-पिता से मिलते हैं।

लिंग निर्धारण की क्रिया सभी जन्तुओ मे समान नहीं है। अधिकतर जन्तुओ मे यह गुण सूत्र पर निर्भर करता है। किन्तु कुछ जन्तुओं मे अन्य कारण भी होते हैं। लिंग निर्धारण के कुछ सिद्धान्त निम्न है—

१. XO व XX सिद्धान्तः— यह सिद्धान्त विलसन तथा स्टीवेन्स (१९०५) ने रखा था। उन्होंने देखा कि नर स्कवैश बग्स में मादा की अपेक्षा एक गुणसूत्र कम होता है। उन्होने नर की इस अवस्था को XO अवस्था कहा। उसी समय मे मिलिविवड बग में देखा गया कि यद्यपि नर व मादा में गुण सूत्रों की संख्या समान है किन्तु नर मे क्रोमेटिड एक्स का साथी गुणसूत्र छोटा होता है व भिन्न प्रकार का होता है। विलसन व स्टीवेन्स (१९०५) ने एक्स गुणसूत्र के इस छोटे साथी को Yगुणसूत्र कहा। बाद में देखा गया कि एक्सवाई अवस्था प्रायः पायी जाती है। XX या XY गुण सूत्रों को सेक्स गुण सूत्र तथा अन्य को आटोसोम्स कहते हैं। XO या XY गुण सूत्रों के विचार को हम इस प्रकार दिखा सकते हैं।

(अ) XO या XY विचार में विभिन्नतायें — XY का जोडा तो नर मनुष्य में पाया जाता है। किन्तु इससे भिन्न प्रकार के सम्बन्ध भी अनेक प्रकार के जन्तुओं मे पाया जाया है जैसे—

(i) कभी २ सेक्स क्रोमोसोम्स अलग नही पहचाने जाते बल्कि सेक्स लिंक्ड जीनस पर रहते हैं।

(ii) कभी २ X व Y गुणसूत्र किसी ऑटोसोम्स के साथ चिपके रहते हैं या Y गुणसूत्र टुकड़ों में बंट जाता है।

(iii) कभी २ XX जोडा नर में तथा XY जोडा मादा मे पाया जाता है जैसे पक्षियों में।

(iv) शहद की मक्खी व ततैये मे सेक्स क्रोमोसोम्स मादा मे डिपलायड तथा नर मे हेप-लायड होते है। इस प्रकार अनेक प्रकार के सम्बन्ध विभिन्न जन्तुओं मे पाया जाता है।

(v) लिग गुणसूत्रो के कार्यः—विटसन तथा स्टीवेस के प्रयोगों से सेक्स क्रोमोसोम्स का महत्व तो स्पष्ट अवश्य हो गया किन्तु सेक्स निश्चित करने मे सेक्स क्रोमोसोम्स का वास्तविक काय क्या है। इस बारे मे अनेक उलझने बनी रही। मुख्य प्रश्न यह था कि क्या Y गुणसूत्र की उप-स्थिति का अर्थ जीव का नर होना है या नही। ड्रोसोफिला मे यह देखा गया कि साधारण मादा मे दो X तथा एक Y गुणसूत्र (XXY) था। तथा साधारण नर में केवल एक X गुणसूत्र तथा Y नहीं था अर्थात् XO अवस्था। लगभग सभी चिडियों में नर मे XX तथा मादा में XY अवस्था पायी जाती है। इन्ही उदाहरणों ने उल-झने उत्पन्न की तथा इनका हल दिया पैंटसन नामक वैज्ञानिक ने पेंटसंन ने कहा कि नर या मादा होना नर के X गुणसूत्र पर निर्भर करता हैं तथा X गुणसूत्र कोई मुख्य भूमिका नही निभाता उसका विचार यह था कि प्रत्येक नर शिशु मादा से एक X गुणसूत्र तथा दूसरा पिता मे प्राप्त करता है। यह दोनों X गुणसूत्र मॉरगन के अनु-सार एक प्रकार के होते है अतः पेंटसंन ने कहा कि नर या मादा होना X गुणसूत्र पर निर्भर, संख्या के अनुसार करता हैं। यदि X क्रोमोसोम एक है तो नर व अधिक हैं तो मादा पेंटसंन के अध्ययन को मारगन तथा ब्रिग्स (१९१६) की खोजों द्वारा सहारा मिला। मारगन ने बताया कि Y गुणसूत्र पर जीन नही होते और यह निष्क्रिय होते हैं जबकि X गुणसूत्र पर सेक्स लिंक्ड जीन होते हैं। यद्यपि नयी खोजों से पता चला है कि मनुष्य के Y गुणसूत्र पर भी सेक्स लिंक्ड जीनस होते है।

२ जीवन संतुलन सिद्धान्तः— लिग क्रोमो-सोम्य की महत्व ज्ञात हो जाने के बाद शीघ्र यह बात भी स्पष्ट होने लगी कि लिंगनिर्धारण पूर्ण-तया लिग-क्रौमोसोम्स पर निर्भर नहीं करता वल्कि कुछ और भी बाते हैं जो इसपर असर डालती है। ब्रिग्स ने ड्रोसोफिला कीट पर प्रयोग किया व जीन सतुलन सिद्धान्त को सामने रखा। वह सिद्धान्त उन जीनस के विषय मे बताती है जो नर या मादा बनाने में भाग लेते हैं तथा X क्रोमो-सोम्य पर तथा आटोसोमस पर लगे रहते हैं। ड्रोसो-फिला में नर व मादा की अनेक जातियाँ पायी जाती है जो लिंग गुणसूत्र तथा आटोसोम के कारण है जैसे —

XXX आटोसोम्य के ३ जोडो के साथ–मादा
X आटोसोम के ३ जोड़ों के साथ–नर

अतः ब्रिग्स के अनुसार X क्रोमोसोम लिग निश्चित नही करता अपितु लिंग X गुणसूत्रों व आटोसोम्य पर पाये जाने वाले जीन के अनुपात पर निर्भर करता है। अतः इस विचार के अनुसार नर व मादा के जीन्स X गुणसूत्र व आटोसोम्य दोनों पर पाये जाते है और एक ही समय पर

दोनों सेक्स के कार्य करते हैं। इस प्रकार निम्न जातियाँ बनाती है।

(क) XX आटोसोन के ३ जोड़ों के साथ
XXX „ „ ४ „ „
(ख) XXX आटोसोम के २ जोड़ों के साथ
XXXX „ „ „ „ मेटाफिमेल
(ग) X „ „ ३ „ „ मेटामेल

ड्रोसोफिला की आटोसोमस के एक जोड़े मे ६ गुणसूत्र होते हैं। इन प्रयोगो से स्पष्ट कि नर जीन ओटोसोम्स पर पाया जाता है और मादा X गुणसूत्रों पर तथा आटोसोम्स के दो जोड़ों पर पर्याप्त नर जीन होते हैं जो X गुणसूत्र के मादा जीन का प्रभाव भी ढक लेते हैं अतः यदि X को सख्या आटोसोम्स में सामान्य जोड़े से अधिक हो जाती है तो मादा बनता है और यदिआटोसोम्स जोडे की संख्या X गुणसूत्र की सामान्य संख्या से बढ़ जाती है तो नर बनता है। इसी प्रकार किसी मनुष्य में यदि एक X गुणसूत्र पाया जाता है तो वह नर बनता है क्योकि आटोसोम्य पर नर जीन X गुणसूत्र पर पाये जाने वाले मादा जीन को ढक लेता है। किन्तु यदि दो XX गुणसूत्र है तो XX पर पाये जाने वाले मादा आटोसोम पर होते हैं, और नर X गुणसूत्र पर अतः उन चिड़ियों पर जिनमें एक Xगुणसूत्र होने पर मादा तथा XX होने पर नर होते हैं।

३. हार्मोन सिद्धान्तः— छोटे प्राणियों पर जीन सतुलन सिद्धान्त सफलता पूर्वक कार्य करता है तथा उच्च प्राणियों में गोनेडस द्वारा बनाये गये हार्मोन्स का पर्याप्त प्रभाव देखा गया हैं। यह सिद्धान्त क्रीव द्वारा चिडियों पर किये गये प्रयोगों पर आधारित है। क्रीव ने देखा कि एक मुर्गी जो निषेचित अंडा बनाती है टयूबरकुलेसिस द्वारा अपना अंडाशय नष्ट कर देती है। उसने शुक्राणु बनाने प्रारम्भ कर दिये और उसमें कलगी बन गयी तथा वह मुर्गी मुर्गे में परिवर्तित हो गई। क्रीव के अनुसार जब अंडाशय नष्ट हो गया तो अडाशय द्वारा उत्पन्न होने वाला हार्मोन बनना बद हो गया जिसे सुषुप्त वृषण जो प्रायः सभी चिड़ियों में उपस्थित होता है विकसित होना प्रारम्भ हो गया। इन वृषों हार्मोन बनाने प्रारम्भ कर दिये जिसके द्वारा कलगी बन गयी तथा यहाँ तक की आवाज मे भी परिवर्तन हो गया। ऐसे ही उदाहरण उभयचर, मछली व कबूतर वर्गों से भी प्राप्त होते हैं—

केटलस में पायी जाने वाली फ्री मोशन मे भी लिंग हार्मोन का प्रभाव देखने में आता है। फ्री मोशन में विपरीत सेक्स में जुड़वा बच्चे होते है। जिनमें नर तो सामान्य होता है किन्तु मादा स्टीराइल होता है। लिलि ने इसका अध्ययन किया व पाया कि विकास के प्रारम्भ में कामन ब्लड वेसल होने के कारण नर भ्रूण का रक्त मादा में तथा कादा भ्रूण का रक्त नर मे जाता है। इन रक्तो मे हार्मोन्स भी होते है। अतः हार्मोन्स मिल जाते हैं। अत चूंकि नर हार्मोन पहले बनते हैं अतः मादा में गोनेड के विकास की दिशा नर की ओर के विपरीत होती है। किन्तु मादा मे हार्मोन्स

चूंकि बाद में बनते हैं अतः नर के गोनेड पर अपना प्रभाव नही डाल पाते।

४. वातावरणीय प्रभाव का सिद्धान्त—बेल्ट-जार के अनुसार वातावरण भी सेक्स के बनने में सहायता करता है बेल्टजार ने बोनेलिया का उदाहरण रखा। इसका गर्मी मे लार्वा जब स्वतन्त्रता से पानी में तैर रहा होता है तो यदि मादा प्रौढ के के सम्पर्क में आ जाता है तो नर बन जाता है तो मादा बनता हैं। अत. मादा का स्पर्श सेक्स निर्धारित करने मे सहायक हैं। एक अन्य उदाहरण ओफ्रयोट्रोका ओवरी का है जो नर की भाति कार्यकरता है, किन्तु जब वह पुराना हो हो जाता है और २० से अधिक खण्ड बना लेता है तो वह मादा बन जाता है। यदि इसके खंडों को काट कर या भोजन न देकर छोटा रहने दे तो यह नर की भांति कार्य करेगा।

रोटीफर्स में यदि आक्सीजन व भोजन की मात्रा कम या परिर्तित कर दी जाये तो विकसित होने वाले भ्रूण में लिग को बदला जा सकता है।

अतः हम देखते हैं कि यद्यपि अधिकतर जन्तुओ में लिग के निर्धारण का आधार गुणसूत्र हैं किन्तु कुछ जन्तुओं मे वातावरण भी चाहे वह बाहरी हो या जन्तु के भीतर का हो लिग के निर्धारण पर अपना प्रभाव डालता हैं।

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पेट्रोलियम भी कोयले के सामान एक जो वाशय ईंधन है। वैज्ञानिकों का कहना है कि पेट्रोलियम लाखो करोड़ों वर्ष पहले उथले पानी में उपजने वाले पादपों से बना है।

ग्रहों का मानव जीवन से सम्बन्ध

धीरेन्द्र सिन्हा

"ग्रह मनुष्य के तुच्छ शरीर पर शासन करते है और बड़ी सरलता से उसके जीवन मे उतार-चढ़ाव लाते हे"। – मिल्टन

ग्रहो का अध्ययन बहुत प्राचीन काल से होता आया है। सबसे प्राचीन कृति सारगन I के लघु लेख माने जाते है जो कि ३८०० बी सी मे लिखे गये।

ग्रहो का अध्ययन खगोल विज्ञान व ज्योतिष शास्त्र मे होता आया है। वास्तव मे जहा हिन्दू ऋषि-मुनि ग्रह विज्ञान के ज्ञाता थे वहा चीनी खगोल विज्ञान के। इस बात के प्रबल प्रमाण मिलते है कि चन्द्र ग्रहण का अध्ययन खगोल विज्ञान व ग्रह विज्ञान दोनो ही दृष्टि से ११३६ बी सी मे किया गया। ग्रीक खगोल विज्ञान की कहानी का प्रारम्भ थेल्स के जन्म से (६२० बी सी) माना गया है। पैट्रिक मूर ने अपनी पुस्तक गाइड टू द प्लैनेट्स मे लिखा है कि "खगोल विज्ञान सभी विज्ञानो से प्राचीनतम है। परन्तु अनेक तथ्यो से ऐसा स्पष्ट प्रतीत होता है कि ज्योतिष शास्त्र प्राचीनतम विज्ञान था न कि खगोल विज्ञान। महाभारत युद्ध में भीष्म ने अपनी मृत्यु की इच्छा सूर्य उत्तरायण होने पर व्यक्त की और वह शर-शय्या पर लेटे रहे। वास्तव मे भीष्मपितामह ज्योतिष शास्त्र के महान् विद्वान थे। ज्योतिष के अनुसार सूर्य उत्तरायण होने पर देवयान प्राप्त होता है। यह घटना ५००० वर्ष पूर्व की है।

सत्य तो यह है कि ज्योतिष शास्त्र उतना ही प्राचीन है जितने वेद आदि क्योंकि अथर्ववेद मे ज्योतिष शास्त्र नामक शीर्षक के अन्तर्गत १६५ मन्त्र आए है। तब तक ज्योतिष शास्त्र के अन्तर्गत सूर्य व चन्द्र की विविध गतियों का व उनके प्रभावो का अध्ययन होता आया था। वेदो मे लिखे मन्त्रो के द्वारा इसे इस ससार से सम्बन्धित किया गया व इसकी उपयोगिता व वैज्ञानिकता को प्रमाणित किया गया। अत आधुनिक ज्योतिष का निर्गम हम अथर्ववेद ज्योतिष से मान सकते है। इसके अतिरिक्त पाराशर वराहमिहिर भृगु महाराज आदि के ग्र थ प्रमाणिक है।

हमारे ब्रह्माण्ड मे सात प्रमुख ग्रह सूर्य चन्द्र, बुद्ध, शुक्र, शनि, बृहस्पति, मङल है। इस के अतिरिक्त यूरेनस नेपच्यून व प्लूटो को भी सम्मिलित किया गया है। परन्तु हमारी हिन्दू पद्धति मे सू०, म०, बु०, बृ०, शु०, श के अतिरिक्त राहू व केतु को माना गया है। इनमे से प्रत्येक ग्रह का अपना पृथक व स्पष्ट प्रभाव मानव जीवन पर है। यह तो वैज्ञानिक रूप से प्रमाणित है कि ज्वार भाटे का कारण चन्द्र है।

न्यूटन के गुरुत्वाकर्षण के नियम से पता चलता है कि विश्व की किन्ही दो लघुतम अथवा

दीर्घतम निकायों के बीच निरन्तर आकर्षण बल लगता है। अन्य आकाशीय - पिण्डो की अपेक्षा सूर्य व चन्द्र की पृथ्वी से निकटता के कारण आकर्षण शक्ति का प्रभाव पृथ्वी पर अधिक पडता है। चूंकि चन्द्रमा पृथ्वी से सूर्य की अपेक्षा अधिक निकट है, अतः छोटा होने पर भी सागरीय जल को आकर्षित करने में अधिक प्रभावी होता है। यही कारण है कि परिक्रमा करते हुए जब पृथ्वी चन्द्र और सूर्य एक सीध मे आ जाते है तब उनकी सम्मिलित आकर्षण शक्ति से सबसे अधिक ऊंचे ज्वार आते हैं जिन्हें वृहन ज्वार कहते है। ऐसा केवल पूर्णमासी व अमावस्या को होता है।

इसके विपरीत कृष्ण व शुक्ल पक्ष की अष्टमी के दिन चन्द्रमा, सूर्य व पृथ्वी समकोण पर होने के कारण अपने आकर्षण प्रभावो को न्यूट्रल कर देते हैं, फलतः लघु ज्वार आता है।

ग्रहो के प्रभाव को एक नवीनतम घटना पूर्ण सूर्य ग्रहण हैं जो कि १९८० में हुआ था। सूर्य-ग्रहण पर सूर्य व पृथ्वी के बीच चन्द्रमा आ जाता है जिससे विश्व के किसी एक क्षेत्र या भाग में सूर्य की किरणों का पहुंचना बन्द हो जाता है।

भारत मे पूर्ण सूर्य ग्रहण (१९८०) के अवसर पर विविध घटनाओं का अध्ययन किया गया। जैसे ही सूर्य का प्रकाश पृथ्वी पर पहुंचना बन्द हुआ कुछ ही क्षणो मे सभी जीव-जन्तु शान्त, निश्चल व गतिहीन से हो गये। चारो ओर निस्तब्धता सी छा गई जैसे पृथ्वी पर जीव न हो। सूर्य, जिसे शक्ति, स्फूर्ति व आकाश का राजा कहा जाता है, के छिप जाने पर इन घटनाओ का होना स्वाभाविक प्रतीत होता है।

ग्रहों के मानव जीवन पर प्रभाव के बीच तरंगो का सिद्धान्त छिपा हुआ है। प्रत्येक ग्रह निरन्तर तरंगे उत्सर्जित कर रहा है तथा जब मानव का जन्म होता है तब वह किसी निश्चित ग्रह की छाया मे रहता है और उसी ग्रह की तरंगो के द्वारा उसकी सर्वाधिक प्रबल विशेषताओ, प्रवृतियों आदि का निर्माण होता है। यह एक वैज्ञानिक तथ्य है।

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फ़ोटोफ़ोन—

वह ज़माने लद चुके जब आप और वह फ़ोन पर
बात कर लेते थे, पर दीदार से महरूम थे।

अब तो फ़ोटोफ़ोन है डायल घुमा कर देखिये,
बात भी हो जायेगी दीदार भी हो जायेगा।

— फ़ारिग़ी

बौने पौधे

आर० सी० शर्मा

छोटा सा आँगन मेरा,
और फैली इसमें छाँव धूप।
सिमट-सिमट कर बन गया,
वट विशाल का बौना रूप।

वनस्पति का मानव से शाश्वत सम्बन्ध है। मनुष्य के आगमन से पूर्व ही वनस्पति विश्व के धरातल पर विद्यमान थी। वनस्पति मनुष्य के धर्म, अर्थ, काम और मोक्ष मे पूर्ण सहायक है। इतना ही नही, वनस्पति विश्व मे उस निराकार प्रभु का साकार स्वरूप भी है। यह वनस्पति ही तो मनुष्यत्व एव देवत्व के मध्य सम्बन्धो का प्रमुख माध्यम रही है। हमारे प्राचीन ऋषि मुनियों ने वनस्पति के बीच बैठकर ईश्वर का साक्षात्कार किया।

हमारे सभो धार्मिक कार्यक्रम, पूजा, विवाह, यज्ञ आदि आज भी तुलसी, पीपल, बरगद, ढाक, और आम के पत्तो के बिना सम्पन्न नही होते।

इसी विचार श्रृंखला की तारतम्यता मे मेरे मन मे भी विशाल वृक्षो को छोटा बनाकर घर और ड्राईंगरूम को नेचूरल तरीके से सजाने की बात सूझी। क्या बड़े-बड़े विशाल पौधो को बौना बनाया जा सकता है? अचानक ही एक दिन जब मेरी निगाह पुरानी दीवार पर उगे, कई वर्ष पुराने, छोटे से बरगद पर पडी, ता उसी से प्रेरित होकर मैंने बौने पौधे बनाने शुरु कर दिये।

जापान मे प्राचीन काल से इस कला का बहुत प्रचलन रहा है। आज विश्व के अनेक दूसरे देशो मे भी बहु मंजिली इमारतो में बसने वाले लोगो मे, **बौने पौधो** से घर सजाने का फैशन है चूंकि थोडी सी जगह में ही इस प्रकार के कई पौधे सुविधा से रखे जा सकते हैं।

बौने पौधे लगाने की विधि—

इन बौने पौधो को बनाने के लिये कटिंग अथवा बीज से पौधे उगाये जाते हैं। इन्हे छोटे-छोटे खूबसूरत आकार वाले गमलो मे मिट्टी और पत्तियो की खाद मिलाकर लगाया जाता है। इन पौधो को नम और छायादार स्थानो में रखा जाता है।

इनकी शाखाओ को तरीके से खास दिशा मे तराश कर, और मोडकर इन्हे और भी ज्यादा आकर्षक बनाया जा सकता है। इनके लिये **पानी का विशेष ध्यान रखा** जता है। बौने पौधो में अपने अलग,अलग मौसम पर जब फूल और फल लगते हैं तो इनका सौन्दर्य देखते ही बनता है।

बौने पौधे लगाने का समय—

आप स्वय भी बौने पौधे, जैसे–बरगद, पिलखन, सेमल, अनार, चीड, गूलर और खिरनी आदि तैयार करके अपने आँगन और ड्राईगरूम की शोभा बढ़ा सकते हैं। इन पौधो को लगाने का **उपयुक्त समय फरवरी** का अन्तिम सप्ताह **मार्च का प्रारम्भ तथा जौलाई** एव **अगस्त का** महीना होता है।

विश्व मे जिस दिन वनस्पति नही रहेगी उस दिन मानव का अस्तित्व भी समाप्त हो जायेगा।

एवोगाद्रो परिकल्पना त्रुटिमय

– कुलदीप कुमरा मेहता

एवोगाद्रो परिकल्पना के अनुसार " समान दाब व ताप पर गैस के समान आयतन मे अणुओ की सख्या समान होती है ।"

इस परिकल्पना के अनुसार " यदि हम एक गैस को निश्चित आयतन के बर्तन मे निश्चित ताप व दाब पर ले, तो उसमे गैस के अणुओ की सख्या निश्चित होगी । लेकिन यदि हम दाब अथना ताप मे से कोई भी कारक (बिना आयतन बदले) परिवर्तित करे तो एवोगाद्रो परिकल्पना के अनुसार अणुओ की सख्या परिवर्तित होनी चाहियें लेकिन ऐसा नही होता ! गैस के अणुओ की संख्या मे परिवर्तन तब तक नही होगा, जब तक गैस के बर्तन मे, (निश्चित आयतन पर), बाहर से गैस न प्रवेश कराई जाये । अत. इससे यह स्पष्ट होता है कि एवोगाद्रो परिकल्पना मे उल्लेखित दाब व ताप का कोई महत्व नही है । इस परिकल्पना मे दाब व ताप का महत्व इस प्रकार सिद्ध किया जा सकता है, अगर हम एवोगाद्रो परिकल्पना का उल्लेख निम्न रूप से करे–

"दाब व ताप के समान अनुपात पर (अर्थात् $\frac{\text{दाब}}{\text{ताप}}$ = स्थिरांक) गैस समान आयतन मे अणुओं की संख्या समान होती है ।"

उपरोक्त परिकल्पना के अनुसार यदि हम दाब व ताप मे से कोई कारक परिवर्तित करे तो दूसरा कारक भी उसी परिमाण मे परिवर्तित हो जाएगी अत $\frac{\text{दाब}}{\text{ताप}}$ अनुपात भी नियत रहेगा क्योकि वायल के नियम के अनुसार $\frac{\text{दाब}}{\text{ताप}}$ नियत (समान आयतन के लिए) होता है । जब दाब व ताप का अनुपात नियत रहेगा तो अणुओ की सख्या भी नियत रहेगी ।

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वनस्पति—

जन्म सागर में विजय धरती पर
वाह क्या रंग है वनस्पति पर ।

—फारिग

जुल्म

—शंकर बदायूंनी

मजहब के नाम पर न करो जुल्म दोस्तो,
सच बात को कुबूल करो खुदा से डरो।

ब्रूनो को जिन्दा आपने क्यूँ कर जला दिया
गेलीलियो को कारागार मे बसा दिया।

क्या इससे जमीं घूमने से बाज आ गई
या आपके मज़हब में कोई जान आ गई।

होता नही अच्छा, हो नशा चाहें किसी का
मज़हब का हो, दौलत का हो या लालपरी का।

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any given time was necessarily small, and when the Cape farmer saw good grazing land unoccupied, he naturally thought that he could occupy it. His occupation, however, differed fundamentally from that of the Bantu He fenced it and stocked it and kept out intruders Even where Bantu tribal chiefs had permitted white men to use their tribal lands, the tribesmen necessarily regarded such action as encroachment. For many years the Government tried to prevent contact between the settled areas and the Bantu, but a small colony could not police such vast areas In 1835 a mass movement of the Bantu in retaliation for a severe commando raid was followed by a decision to expel them; but the Governor's decision was reversed by the Imperial Government as unjust to the tribes and the Governor himself was recalled. Not until 1846 was the land annexed, and then it did not form part of Cape Colony, but was administered by the chiefs under the Governor as High Commissioner and 'Paramount Chief'.

All this was quite contrary to colonial notions, especially those of the Boers, as the Afrikaner frontiersmen were called. They wanted land, and they hated all government Above all, 'starting with an endowment of the late seventeenth-century Calvinism and brought up for generations among slaves or Bushmen and Hottentot serfs, and latterly barbarians, they [Boers] held as firmly as any politician in the Carolinas that there was a divinely appointed gulf between themselves and such as these'[1] They therefore had no sympathy whatever with a Government which would not let them take land, insisted on governing, and even insisted on protecting the 'natives'. These causes produced the Great Trek, which led to the foundation of the Transvaal and the Orange Free State It led also to the conclusion that these States should hate the country which had taxed them, emancipated their slaves, cut off their cheap Bantu labour, protected their Hottentot servants, and generally acted the philanthropist to inferior peoples. The fundamental cause of the Great Trek was land-hunger, but British philanthropy also played a part.

[1] *Cambridge History of the British Empire*, Vol VIII, p 359

Between 1834 and 1840 ten thousand men, women and children, mainly of Dutch extraction, braved the Chaka, the Matabele and the Zulu and trekked into the vast interior The main body of the Great Trek moved down into Natal, where there was a small British settlement which the British Government, anxious to limit its commitments, had consistently refused to recognize. The coming of the Boers stirred up the Zulu and compelled Cape Colony to take action The British Government at last consented to the recognition of the Natal settlement and its incorporation into Cape Colony. In 1844, however, it became a separate colony

Meanwhile Jan Mocke, leader of the Boers north of the Orange River, had declared a republic in 1842, thus disturbing the Griquas on the west and the pre-trek farmers on the east In 1843 some of the latter petitioned to be included in the Natal settlement, but the Cape Governor did no more than conclude treaties with the tribes by which, in return for subsidies, they undertook to maintain order. By implication, the Colony undertook to give protection, and in 1845, when the usual trouble broke out with the Boers, a British force had to be sent to protect the tribes. In 1846–7 a new Kaffir war broke out, and as a result the boundaries of Cape Colony were taken up to the Orange River and the Governor became Paramount Chief of British Kaffraria. He also tried to persuade the Boers to return to Natal, but as they refused, British jurisdiction was proclaimed over the Orange River Sovereignty

The position in 1850, therefore, was that there was a British colony at the Cape, partly English and partly Boer, another colony in Natal with a small British population; a third colony known as the Orange River Colony, but almost entirely Boer so far as its European population was concerned, and a state of anarchy in the Transvaal, where Boer sovereignty had been proclaimed but never made effective. Another Kaffir war in 1850 compelled Great Britain to reconsider the position At the Sand River Convention in 1852 the independence of the Transvaal was recognized At the Bloemfontein Convention of 1854 the British Government went

even further and recognized the independence of the Orange Free State. These decisions did not imply only that the Boers were given two independent States, they also implied that Great Britain gave up the 'Quixotic philanthropy' of trying to protect the tribes against the Boers hundreds of miles from Cape Town. 'The grant of unequivocal independence to the Boers of the Transvaal and of the Orange River Territory abandoned a large native population to the attacks of land-hungry farmers who, intolerant of any form of equality between white and black, proceeded either to dispossess the natives of their land and to absorb them as servants, or to confine them to inadequate areas, substituting a nervous military control for the tribal government which the shock of contact with the Europeans had seriously and inevitably weakened.'[1]

It is now clear that, in surrendering the Orange River Sovereignty, a mistake was made. Great Britain could not evade its responsibility by dividing South Africa. Though the tribes were different, the native problem was one from the northern boundary of Zululand to Basutoland on the east and Griqualand on the west. Any movement in or against the one travelled south or north and affected the other. Unrest in Zululand, stimulated by the Transvaalers, inevitably affected Natal directly and, by its repercussion in Basutoland, the Cape indirectly. The ideal of the Colonial Office was a naval base at Simonstown and a small British colony, with responsible government, at the Cape. It could not work. South Africa had become an indivisible whole through the spread of the whites, and Great Britain had either to accept direct responsibility or to create a self-governing colony from the Cape of Good Hope to as far north as white people might percolate.

It is to the credit of Sir George Grey, Governor of Cape Colony from 1854 to 1861, that by 1858 he had realized the position. When he was asked in that year to assist the Free State against the Basuto he refused to do so; but he sent home a despatch in which he insisted that the solution was a

[1] *Ibid.*, Vol. VIII, p. 392.

federation of the two colonies and the two republics with a form of government remarkably like Dominion status The Colonial Office would have none of it. It thought that the proposal involved 'either enormous expense or the independence of South Africa' The Colonial Office was, of course, quite correct. It had to choose between imposing its own native policy on the whole of South Africa, at enormous expense, or letting the South Africans combine and impose their own very different native policy. In the end the latter was chosen after nearly fifty years of conflict, involving two unfortunate, expensive and unnecessary wars

Opinion in Great Britain had, in fact, changed by 1868 It was then seen that the policy of 'limited liability' would not work The only way to enable Great Britain to get rid of its responsibility was to confer responsibility on a federated South Africa This, of course, involved allowing the South Africans to determine native policy The solution appeared, however, to be inevitable. The accession of the third Napoleon and the rising power of Bismarck's Germany compelled Great Britain to 'look to her moat' and to withdraw as far as possible from imperial commitments. In 1867 the North American colonies had not only settled their differences but seemed likely to relieve Great Britain of its responsibility for defence Local conditions in South Africa seemed to lead to the conclusion that a federated South Africa should follow the Canadian example Cape Colony had a conflict between the English East and the Dutch West much as the Province of United Canada had been divided. The Orange Free State was on the verge of bankruptcy and the Transvaal had never got out of the state of anarchy created by the disputes of the Boers after the Great Trek There were, besides, the perennial problems of native policy. Something had to be done about Basutoland because the activities of the Free State frontiersmen threatened a Basuto rising which would affect Cape Colony. Something had to be done about Zululand because the activities of the Transvaalers threatened a Zulu rising which would engulf Natal. In addition to all this, diamonds were discovered

in Griqualand, which was no-man's-land so long as it was mostly arid waste, with a few wandering Griquas and a few frontiersmen at the springs. With the discovery of diamonds, a motley crowd of adventurers, mainly British, poured in. The Transvaal and the Free State claimed portions, while the tribes claimed British protection and the diggers clamoured for annexation.

This series of problems, combined with the growing menace in Europe, converted the British Government to Grey's policy of a South African federation, with responsible government, which of course carried the corollary that the South Africans—and not Great Britain—would determine native policy The first step was the annexation of Basutoland in 1867–8, taken with much hesitation after the Basuto had twice appealed for annexation because of their war with the Free State Basutoland was placed under the Governor of Cape Colony, as High Commissioner, however, not as Governor, that is, the Imperial Government and not the Cape Government assumed responsibility. When the problem of the diamond fields arose, the Colonial Office was prepared for annexation only if Cape Colony assumed the responsibility for government Unfortunately, the Colonial Office was badly served by its local representatives. The new policy required that the two colonies should establish friendly relations with the two republics so that all four might join a self-governing federation Sir Henry Barkly was sent as Governor in 1870 because he had had experience of colonial self-government in Australia. Concentrating on the issue of self-government for Cape Colony, he had too narrow a vision to make certain that the Griqualand problem was solved in such a way as to lead to, or at least not interfere with, South African federation. He secured a narrow majority for Cape self-government in 1872, but meanwhile he had estranged the Free State and caused the Transvaal to move closer to the Free State.

The Griqualand problem is involved. Its essence is that the Free State claimed part of Griqualand as its territory. The claim was ultimately found by a British court to be good, but

meanwhile it looked bad The claims of the tribes, which appeared to be good, and which Great Britain therefore supported, were found to be based upon forged documents. The Free State eventually agreed that it did not want the diggings, which were occupied mainly by a British population, but compensation had to be paid. It is not that the annexation was bad policy, but that Barkly's manner of effecting it was bad policy. In fact, he went directly contrary to his instructions, for Griqualand West was not accepted by Cape Colony and had to be made into the third colony of South Africa More important is the fact that the Free State was justifiably angry and that the Transvaal, having withdrawn its own claims, had supported the Free State The dispute was part of the process by which, while the Colonial Office was developing the idea of a self-governing South Africa under the British flag, the Afrikaners developed the idea of an Afrikaner South Africa by which the British could be pushed into the sea. Henceforth the native problem took second place and the essential difficulty of South Africa was the conflict between English and Dutch.

It is unnecessary to tell the tale of the next thirty years. The British annexation of the Transvaal in 1877 possibly saved the Transvaalers from annihilation by the Zulus, but the Zulu War nevertheless broke out, and the Transvaalers doubted whether they had been saved. Possibly an immediate grant of self-government would have brought the Transvaal willingly into the federation. It was delayed, and self-government was granted, not as elsewhere, willingly and freely, but after the Boers had rebelled and had defeated a British force at Majuba Hill. The Transvaal war completed the work of the Griqualand annexation by making the Afrikaners conscious of themselves as Afrikaners There was a strong movement for 'a united South Africa under our own (i.e. the Afrikaner) flag'. Fortunately, the Cape produced statesmen who resented the tendency to split South Africans along racial lines. Just as, in Canada, Baldwin worked with Lafontaine and John A Macdonald with Cartier, so in the Cape

Cecil Rhodes worked with Jan Hofmeyer, who realized that 'the independence of South Africa was at the mercy of any Power which held the command of the sea'[1] and that there was never any question of turning the British out of the country Accordingly, he concluded that South Africans of either descent must work together. Though Cecil Rhodes, for his part, was an 'imperialist', he thought of South Africa, not as a colonial dependency of Great Britain, but as a nation in its own right This nation could not be wholly Anglo-Saxon by race, and he therefore co-operated with the Afrikaners Thus Hofmeyer the Afrikaner imperialist and Rhodes the British imperialist collaborated, until the Jameson raid, in the development of a united South Africa.

The way was certainly hard Leaving aside the historic suspicions of the Transvaalers, which were reinforced by the Transvaal war, and the new suspicions of the Free State after the Griqualand incident, each of the four entities thought in terms of its own narrow interests The Transvaal taxed colonial produce and the Cape retaliated by taxing Transvaal tobacco. Natal began a tariff and railway war against the Cape The coastal colonies refused to give tariff rebates to the Free State and the Transvaal. The Cape would not agree with South African free trade, President Kruger of the Transvaal wanted federation with the Free State, but would have nothing to do with the British Government or British traders; Natal flirted with the Transvaal to get trade through Durban. Rhodes did get, in 1888, a partial Customs Union with the Free State, and in 1889 a railway agreement. The final blow, however, was the outbreak of the Boer War. The discovery of gold in the Witwatersrand in 1886 converted the Transvaal from a poverty-stricken agricultural community to a wealthy State with a large urban population Though Kruger welcomed the wealth, he did not welcome the Uitlanders. As in the Griqualand diamond mines, they were almost wholly British in sentiment, though many were South Africans from the Cape and Natal. They were not treated as Transvaalers, they were

[1] *Ibid*, Vol. VIII, p. 308.

refused the franchise, and yet they were conscripted into the commandos. In other words, they had genuine grievances, though whether those grievances need have led to the Boer War is a matter on which historians dispute. The damage was done, actually, by the Jameson raid. The Rhodes-Hofmeyer combination was broken at the Cape, Natal, which had at last voted for responsible government in 1893, decided against South African federation, everywhere Afrikaner opinion was consolidated and the union of the two sections of the people broken.

The Boer War was the cause of much suffering in South Africa. It did, however, solve the country's major problem. After 1902 there was no doubt that union or federation must come, and under the British flag. Whatever may be thought of Lord Milner's imperial policy, he and his 'young men' did an excellent piece of social rehabilitation. The main work was done, however, by the leaders of the Boer commandos, especially Botha, Smuts and Hertzog They were fortunate in that the Liberal Government of 1906, coming into power on a wave of reaction to the Boer War, had no doubt that self-government and federation were the solution Self-government was granted immediately to the Transvaal and Orange River Colony (1906–7). The main issue, the relations between these territories and the older colonies, having been settled, events moved quickly. The British had wanted a federal, self-governing South Africa since the 'seventies. The Dutch saw that in a union they would have a majority. The war had not settled the problems of customs and railways. With the pacification of the tribes, their growing preference for money wages in place of cattle, and the break-up of the tribal system, the native problem was much less insistent, but it existed still There was, in fact, a rebellion in Natal in 1906 and martial law had again to be proclaimed in Zululand in 1907

The immediate causes of union were, however, the problems of customs and railways The railways of the Transvaal and the Orange River were operated as a unit, and customs barriers

had been abolished in 1903. There were still many difficulties to be overcome. Agreements about railways were reached at a conference at Pretoria in 1905, but the only resolution with which all four colonies eventually agreed was that unification was the solution. The new Transvaal Government also denounced the customs agreement and another conference was summoned to meet in Pretoria in 1908 This conference failed to reach agreement, except on a resolution that an early union under the British Crown was essential and that the legislatures be asked to send delegates to a National Convention This Convention met in Durban in October, 1908, the Cape being represented by twelve members, the Transvaal by eight, and Natal and the Orange River by five each. Southern Rhodesia sent three delegates with a 'watching brief'. The delegation from Natal was wholly British and that from Orange River wholly Afrikaner. Taking the twenty delegates from the Cape and the Transvaal together, there were twelve Afrikaners and eight British The Afrikaners were thus in a majority, but it made no difference, for it does not appear that divisions were on racial lines. The British knew that the union or federation must be predominantly Afrikaner, and the Afrikaners that they could not get along without the British. Moreover the Transvaal delegates came to the conference with an agreed scheme drawn up by General Smuts.

The proposals made since 1856 had generally envisaged a federal South Africa, a federal State in which each of the four colonies would retain its identity. There was a strong section of opinion, however, which wanted union. This section thought that in the United States the federal authorities had not had sufficient powers, and that sectionalism had led to the Civil War Lawyers like Sir Henry de Villiers (afterwards Lord de Villiers and Chief Justice of the Union) and General Smuts disliked the legal controversies which had arisen in Canada and had resulted in numerous appeals to the Privy Council The weight of opinion in the Transvaal favoured union. The Cape was equally strong for union, once its franchise—which

admitted the coloured people—was protected. The smaller colonies were much more reluctant Orange River Colony came round when it was assured of equal representation in the Senate and a minimum representation for ten years in the House of Assembly Natal, with its huge non-European population and its wholly English tradition, held firmly to federation, not wishing to be swamped by the burghers of the Cape and the Transvaal and not desiring to learn Afrikaans. In the end, however, it accepted the decision, rather than be left out and lose the gains to be derived from railway traffic from the Transvaal The four colonies thus became provinces of the Union with powers larger than those of municipalities, but subject always to the legislative supremacy of the Union Parliament

Whereas Canada and Australia had no reason to fear opposition from Whitehall, there was doubt in the case of South Africa. The settlement required Parliament to enact the colour bar, a requirement for which there was no precedent The Cape franchise was protected by the rule that it could not be altered except by a two-thirds majority—by which it was in fact altered when the South Africa Party under General Smuts formed a coalition with the Nationalist Party under General Hertzog. In the other provinces, however, a purely white franchise was established Much as this was disliked in Great Britain, there was no alternative. Self-government in South Africa implied that the South Africans would determine native policy. The South Africans had insisted upon the colour bar but had accepted a careful compromise over the Cape franchise. The British Government could do no more than accept likewise

The problem was not quite so difficult in relation to the Imperial territories which had not been incorporated in the colonies because they were kept as reserves for the tribes—Basutoland, Bechuanaland and Swaziland. The British Government insisted that special provision be made for them if and when they were handed over. They never have been handed over, and control is vested in a High Commissioner The

South Africa Act was passed by Parliament in 1909 and took effect in 1910, when General Botha of the Transvaal became Prime Minister.

The Union of South Africa was thus the only Dominion which had not an 'English' majority. It was also the only independent country of the Commonwealth in which the great mass of the people, the non-Europeans, took no effective part in the government. In 1951 the population of 12,600,000 contained only 2,600,000 Europeans. Of the Europeans, 60 per cent were probably Afrikaner, though all the younger people were bilingual. Afrikaans, the language of the Afrikaners, is a variety of Dutch, but, having been cut off from close relations with Holland for 150 years, it has developed on lines of its own and has a distinct, though small, literature. The system of law is Roman-Dutch, which has long since disappeared in Holland itself, but South African law has been strongly influenced by English law especially in matters of evidence and commerce.

History supplied the Afrikaner with no sentimental reasons for desiring to maintain a connection with the Commonwealth. Moreover he found himself less and less in sympathy with a Commonwealth which included seven 'non-European' countries with a total population approaching five hundred million. Britain's policy of emancipating the Africans, which had already resulted in the independence of Ghana, Nigeria and Sierra Leone, and was producing rapid constitutional developments in Rhodesia and Nyasaland, East Africa and even Basutoland (in the heart of the Union), was anathema to the Nationalist Afrikaner. The only piece of British liberalism left in the Constitution of 1909, the Cape franchise, had been removed, and only white men and women had the vote. Racial intermarriage had been made unlawful. The attendance of Africans at the only South African universities which mattered had been forbidden. Africans had been segregated in African reserves and townships, and they were required to carry registration books or 'passes' when in 'white' areas. In short, segregation, or *apartheid*—described officially as

'separate development'—had been carried as far and as ruthlessly as was possible in a country whose economy was dependent upon cheap African labour.

In the circumstances, the expressed desire of the Nationalists to remain within the Commonwealth requires some explanation, and it is not easy to give it. It may be that the expression was merely tactical. The political conflict was not purely a conflict between the Afrikaners and the English. There have always been Afrikaners in the political tradition of Botha and Smuts who saw that South Africa could not progress without collaboration between the two peoples Though the Nationalists had a majority in the House of Assembly, they probably had no majority among the white electors. Nevertheless, they wanted to establish a republic and so revenge the Boer defeat in the Anglo-Boer War They may have believed that they could get a majority for such a step if they could assert, on the one hand, that the 'alien' monarchy was obstructing the fusion of the two peoples and, on the other hand, that the republic would remain within the Commonwealth Certainly they emphasized both points in their propaganda of 1961

It is also possible, however, that the Nationalists were genuinely concerned about the isolation into which they were being thrust by the growing world antagonism to *apartheid* If so, this was a rational reaction and not an emotional one. The history of South Africa has emphasized the tradition of the small white minority fighting against odds. The Nationalists find a grim pleasure in their martyrdom for what they regard as 'civilization'. On the other hand, South Africa is a developing country requiring a substantial external trade, based upon sterling, and a flow of capital, most of which would be expected to come from London Instead, political and racial conflict, especially at the massacre at Sharpeville in March 1960 (which was clearly unpremeditated, though the Government was stupid enough to defend it), was creating a serious drain on the reserves of gold and foreign exchange and frightening potential investors It was therefore politic to re-

main within the Commonwealth if this could be done without departing by an iota from the policy of *apartheid* or admitting, even by implication, that it was open to criticism

If the second of these explanations is correct, it was based upon a miscalculation. Since 1949, when India decided to become a republic, it has been the practice—applied to Pakistan, Ceylon and Ghana—for a Commonwealth country to seek permission to remain within the Commonwealth as a republic. The basis for this practice is that some Commonwealth countries, including the United Kingdom, have to alter their laws when a Commonwealth country ceases to be part of 'Her Majesty's dominions' Since already there were five Commonwealth countries which were not parts of Her Majesty's dominions—India, Pakistan, Ghana, Malaya and Cyprus (Ceylon had not yet made the necessary constitutional changes)—it would normally be easy to secure consent. On this occasion, however, some of the Prime Ministers would have found it difficult to defend in their own Parliaments a decision formally to allow a country practising racial discrimination to remain in association with their countries They met this difficulty by severely criticizing that policy and so forcing Dr Verwoerd to withdraw South Africa's application

It may be, of course, that he expected this reaction and planned it. This assumes, however, that his conversion to the Commonwealth notion was purely tactical He could go back to South Africa and assure his own people that he had tried to keep them within the Commonwealth, but that the malevolence of Asian and African politicians forced the South Africans once more to tread the path of martyrdom. Whatever the explanation, South Africa ceased to be a Commonwealth country on the 31st May, 1961.

4

THE CARIBBEAN PEOPLES

IN THE reign of Charles II Barbados was 'the principal pearl in His Majesty's Crown'. By the end of the reign of Queen Victoria it was feared that the British West Indies were becoming 'an imperial slum' Even in 1939 a Royal Commission could say that the poorer quarters of some of the towns in the West Indies 'show all the obvious consequences of hunger, disease, ignorance and crime, and of shiftless improvidence'.

The Caribbean territories of the Crown include two colonies on the mainland of America, British Honduras and British Guiana, and a series of islands from the Bahamas in the north and Jamaica in the south (separated geographically by Cuba, Haiti and Dominica) to Trinidad in the west. In the political sense they consist of ten units, some of which are sub-divided. They are British Honduras, British Guiana, Jamaica, the Bahamas, the Virgin Islands, the Leeward Islands (Antigua, Montserrat, and St Kitts, Nevis and Anguilla), Barbados, the Windward Islands (Dominica, Grenada, St. Lucia, and St. Vincent), and Trinidad and Tobago. Of these all except British Honduras, British Guiana, the Bahamas and the Virgin Islands are included in the Federation of the West Indies· but 2,000 miles separate Jamaica from Trinidad. All the territories except the northern tip of the Bahamas lie in the tropic of Cancer, and the southern tip of British Guiana is within 150 miles of the equator. With a few exceptions (e g the oil and pitch of Trinidad), all the territories have the same kind of produce, whose surplus is exported to North America and Europe. They have therefore been in competition with each other and have never been anything like a 'common market' with an advantageous

internal trade Except when it was worth while for ships to call at several ports on the same voyages (as when the banana boats to and from Jamaica call at Barbados and Trinidad), interterritorial communications have been poor. There has accordingly been little incentive to develop a British Caribbean or a British West Indian mentality

When Columbus 'discovered America' in 1492, he actually discovered the Bahamas, Cuba and Hispaniola, though he did reach the mainland of South America on his third voyage in 1498, the year after John Cabot had landed in Nova Scotia, Newfoundland or Labrador. Both thought that they had discovered outposts of Asia, and the West Indies were so called because they were thought to be those islands of the Indies which were reached by sailing westwards from Europe, while the East Indies were reached by sailing eastwards from Europe. Columbus had been commissioned by Ferdinand and Isabella of Spain, and the disappointment of the Spaniards at not attaining the riches of India was qualified by the discovery of the riches of the Inca and Aztec civilizations The West Indies therefore became Spanish military and naval outposts for the protection and provisioning of the treasure ships sailing to and from the Spanish Main. The Spaniards claimed exclusive rights under papal bulls which purported to divide the newly discovered territories between the Spaniards and the Portuguese, with the result that the whole of South America from Mexico to Cape Horn, except Brazil, was claimed as Spanish The papal authority to confer exclusive rights in this way was denied by the French, the Dutch and the English. In particular, Elizabeth of England denied that the Spaniards and the Portuguese owned any territory that they had not effectively occupied Though the Spaniards contested this doctrine, they were unable to prevent English occupation of some of the smaller West Indian islands. Some of the islands of the Lesser Antilles, beginning with St Kitts in 1623, became English early in the seventeenth century, though the first big success was the capture of Jamaica in 1655. The English thus obtained a footing in the Caribbean, which they proceeded to

enlarge during the wars against the Dutch, the Spaniards and the French.

The Caribbean colonies were genuine colonies That is to say, there were few indigenous inhabitants, except on the mainland, and the colonies were settled by migrants from Britain who acquired estates and proceeded to develop them. The crop which proved most successful was sugar, whose cultivation was introduced by the Dutch because their estates in Brazil were being destroyed by the Portuguese Sugar required substantial capital equipment and a large labour force. Even in the British colonies the Dutch supplied both, the labour force consisting of slaves brought from the west coast of Africa The economy of the British West Indies was therefore built on sugar, rum and slaves. One of the objects of English policy was to exclude the Dutch from this lucrative trade, and afterwards the French and the Spaniards. In effect the trade war went on until 1815, but meanwhile the humanitarian attack on the slave trade had developed, and that trade was forbidden to British subjects in 1807 In 1833 the slaves were freed by Act of Parliament, the compensation to the slave-owners costing the British taxpayer £20 million.

Meanwhile social conditions in the Caribbean had been slowly changing There had been little emigration from Britain after 1640 and a large 'mulatto' population had developed. Many of the slaves, or of the offspring of slaves, were freed by their owners even before emancipation became compulsory The African affection for land was carried to the Caribbean, and it was thought to be better to live in squalor as a peasant than to work for an estate. The emancipation of the slaves therefore created a serious labour problem, which was met by the importation of indentured labour from India Many of these 'East Indians' (as they were called to distinguish them from the West Indians) remained in the Caribbean, and their descendants form the largest of the communities in British Guiana and strong minorities in Jamaica, Trinidad and Tobago, Grenada and St. Lucia. Most of the rest of the population is mulatto of varying degrees of colour.

Peasant cultivation had in substantial measure diversified the economy because sugar cultivation required considerable capital. In any case, sugar cultivation was speculative and highly competitive. Over-production tended to become endemic, not only because new centres of production were opened in different parts of the world, but also because cane-sugar had to compete with beet-sugar produced in Europe behind tariff walls. The emancipation of the slaves increased labour costs, and the decision of the Parliament of the United Kingdom in favour of free trade in sugar broke the colonial 'monopoly' of the British market Bananas, coffee, cocoa, cotton and citrus fruits were added to the exports of sugar, molasses and rum, but the Caribbean territories have never recovered the prosperity which some of the inhabitants (and the owners of the estates, many of whom were in England) enjoyed in the days of sugar, rum and slaves

The settled colonies of the West Indies were governed like the settled colonies of North America, and the system was extended to the conquered territories subject (as in British Guiana) to any terms that might be imposed by the treaty of cession. The system derived from the British Constitution of the eighteenth century The King was represented by a Governor who was advised by an Executive Council nominated by and responsible to him, but exclusive powers of legislation and taxation were vested in the local legislature, which consisted usually of a nominated Legislative Council and a House of Assembly elected on a narrow franchise. As we shall see, this system broke down in United Canada and, after the Durham Report, it was replaced by responsible government of the kind which had developed in Britain towards the end of the eighteenth century. The old system was not very successful in the West Indies, either, and indeed it persisted only in Barbados (and in Bermuda). Generally, it was replaced by the 'Crown Colony' system, which applied to conquered and ceded territories Under this system the Assembly disappeared, and the Governor had only nominated Executive and Legislative Councils Following the rioting caused by the

great depression of the 'thirties, there has been a gradual approach to responsible government. In Barbados it has been done by widening the franchise and appointing a Cabinet responsible to the Assembly In Jamaica an elected House of Representatives has been added to the Legislative Council and a responsible Cabinet has replaced the Executive Council. In the Leeward Islands, the Windward Islands and British Honduras the Legislative Councils now consist mainly of elected members In Trinidad and Tobago the Legislative Council consists mainly of elected members and there is a Cabinet responsible to it. British Guiana has had a stormy constitutional history, but now it has an arrangement like that in Trinidad. Generally the Caribbean territories are moving to full internal self-government, which already applies to Barbados and Jamaica

The populations of the various colonies were estimated in 1957 to be as follows

Barbados	230,000
Jamaica	1,650,000
Leeward Islands	130,000
Trinidad and Tobago	750,000
Windward Islands	330,000
	3,090,000
Bahamas	130,000
British Guiana	540,000
British Honduras	85,000
Virgin Islands	8,000
	3,853,000

In this list a line has been drawn above the Bahamas because the territories listed from Barbados to the Windward Islands were incorporated into the Federation of the West Indies in 1958.

The idea of closer union among these small and scattered colonies had prevailed for a long time. Each of them had an expensive establishment, whose cost seemed particularly heavy during the recurrent periods of trade depression. Though the colonies were in competition with each other and with other West Indian islands, it was hoped that uniformity of standards and co-operative marketing would improve the export trade Above all, it was hoped that the creation of a West Indian nation would develop a patriotic tradition and a sense of individual responsibility The slaves exported to the Caribbean had, of course, completely lost touch with their tribal traditions. As slaves they could not be expected, and were not in fact expected, to have any greater sense of moral responsibility than that with which they were treated by their owners Nor could high standards be expected in the slums created by the squatters both before and after the compulsory emancipation of the slaves Something could be done by education over a couple of generations, but before 1940 the Caribbean colonies were crippled by financial difficulties which rendered impossible the creation of adequate social services The colonies have therefore suffered from a socially inherited tradition of crime, vice and immorality. When subsidies became available from United Kingdom funds, something could be done by education and the churches, but it was thought by many that the establishment of a West Indian or Caribbean nation would do much to raise the self-respect of the West Indians The essential difficulty was to create a public opinion favouring closer union among scattered, isolated and self-regarding colonial peoples

The Leeward Islands had been federated in 1871, but a broader federation had been thought impracticable because of the diversity of colonial opinion and the distances of the colonies from each other. In 1922 the Earl of Halifax (as he afterwards became) reported that public opinion was not ripe for federation. In 1928 Antigua suggested that there should be a union of Trinidad, the Windward Islands and the Leeward Islands, and this idea was supported by the West Indian

Sugar Commission in 1930. A special commission appointed in 1932, however, recommended that the federation of the Leeward Islands should be dissolved and that the Leeward Islands and the Windward Islands should be combined under one Governor with separate Executive and Legislative Councils for each island. The immediate objective was to save expense, though the ultimate objective was a West Indian federation. The recommendations were, however, not approved in London. The Royal Commission of 1938-9 found evidence of a political opinion in favour of federation, based upon a belief that political advancement would be easier and speedier if the unit of government were larger. The Commission itself pointed to the advantages to be gained from common services, internal free trade and more experienced officials, but it was content for the time being to recommend the federation of the Leeward Islands and the Windward Islands The broader question was discussed at a conference in 1947, and by 1953 a definite scheme, acceptable to Barbados, Jamaica, the Leeward and Windward Island colonies and Trinidad and Tobago, was put forward The scheme was put into operation in 1958, but there has been much argument about the Constitution and the site of the capital, with Jamaica leading something like a secession movement.

5

THE ASIAN PEOPLES

IN THE 'twenties of the present century British rule and jurisdiction extended to a large part of southern Asia, from the Suez Canal to Borneo. In the west were the mandated territories of Palestine, Transjordan and Iraq which led to the creation, outside the Commonwealth, of Israel, Jordan and Iraq. Further south there were, and still are, the Aden Colony and Protectorate and a number of independent States in special treaty relations with the United Kingdom—Muscat and Oman, Qatar, Bahrain, Kuwait and the seven Sheikhdoms known as the Trucial States. East of Persia was the Indian sub-continent, now occupied by two independent countries within the Commonwealth, India and Pakistan, and by a country which decided to leave the Commonwealth, Burma. Off the southern tip of India is another independent country of the Commonwealth, Ceylon, the first of the Crown Colonies to achieve that status. Separated from Burma by the narrow peninsula of Thailand is the Federation of Malaya, now an independent country of the Commonwealth, and, at the southern tip, the State of Singapore. Further east again are two British colonies, Sarawak and North Borneo, and the British protected State of Brunei. To the north is far-off Hong Kong

India and Pakistan

India, like Europe, was peopled through waves of invasion There are in many parts of the sub-continent primitive tribes which may be survivors of indigenous inhabitants. The oldest living civilization, however, goes back beyond the beginning of recorded history. It is that of the Dravidian-speaking

peoples, the Tamils, Malayalis, Kanarese and Telugus, of the southern tip. It is possible that they were spread throughout the peninsula before the Aryan invasions, which apparently came through the passes of the North-West Frontier These invasions began before recorded history and continued long afterwards, but they appear generally to have stopped at or before the Kistna River. Even the Empire of Asoka, who ascended the throne of Magadha (south Bihar) about 274 B C , went no further south than the northern parts of what are now the States of Mysore and Madras The Dravidian civilization has been profoundly influenced by Aryan ideas, especially through Hinduism, but it remains distinct. The remainder of Hindu civilization is based essentially on the Aryan or Indo-European languages, but these languages, though closely associated with Sanskrit and less closely with the classical languages of Europe, are as diverse as the modern European languages.

Language is, however, only one element in diversity. Religion is another. The later invaders over the North-West Frontier were followers of Islam. Indeed, the Muslims entered Baluchistan only eighteen years after the death of the Prophet in A.D 632 and continued at intervals until the Moghul invasion of 1526 At its zenith under Akbar (1556–1605) the Moghul Empire covered the greater part of the peninsula. Meanwhile, the Europeans had begun to arrive by sea, and the Portuguese, the Dutch, the French and the British all gained a footing. Unlike the earlier invasions, however, these were not mass movements and they had little influence on the composition of the population There are few domiciled Europeans and the Eurasians form but an infinitesimal portion of the people Except for a few Portuguese and French pockets on the coast, British rule or jurisdiction was spread throughout the peninsula in the course of the nineteenth century, but there is no part of India which is specifically British. The chief effect of British rule was to create an English-educated middle class among whom the democratic ideas of Europe were spread and by whom India and Pakistan are governed.

Under British rule, too, the population increased at a rapid and indeed alarming rate In the fifty years from 1891 to 1941 it expanded from two hundred and eighty million to three hundred and eighty-nine million, an increase of nearly 40 per cent; and in the decade between 1931 and 1941 the increase was 15 per cent Every year there are over five million more people to be fed, clothed and housed

Though the whole of India came under British rule or jurisdiction, it was not a political unit Many of the States, resulting from the break-up of the Moghul Empire, were left independent, subject to elements of British control, particularly in respect of external affairs In 1941 they contained ninety-three million people, though they varied in population from the sixteen million of Hyderabad to a few thousand in some of the central Indian States These States have now been absorbed into the Union of India or into Pakistan

As the population figures indicate, the fundamental problem of British India was economic India was a land of cultivators, some holding land from zamindari possessing estates which might be as large as thousands of acres, and some holding as ryots direct from the State The area of British India under cultivation was, however, only two hundred and sixty million acres, or less than one acre per person Rice, wheat and cotton were the main crops, in that order. The only really large industries were cotton and jute, which employed (in registered factories) little more than one million people There were also about 230,000 people engaged in coal mining

Though India was primarily an agricultural country, even before the war it imported more food than it exported Thus, in 1941–2 it exported grains and pulses to the value of rather more than 10 crores of rupees,[1] while its imports of grains and pulses were over 15 crores Its food production was in fact not keeping pace with its population. There was very little cultivable land not under cultivation, and not much more could be made cultivable even by expensive irrigation works. Something could be done, and indeed was being done, by the use

[1] 1 crore = 100 lakhs = Rs 10,000,000 = £750,000

of improved strains of seed and improved methods of cultivation, but improved cultivation was virtually impossible where, as in many parts of India, the land was already divided into plots too small for efficient production.

Before independence, however, the economic problem was submerged in the political problem. Indeed, the economic problem was seen from the political angle. The Indian economy was in the hands of the Government of India, a vast bureaucracy composed mainly of Indians but essentially under British control. What is more, a large part of the capital employed in India was provided by British investors, who drew a dividend, which could be described as a tribute, out of the export surplus. The appalling conditions under which so many Indians had to live, the extraordinarily low level of subsistence, the prevalence of eradicable diseases (such as cholera, smallpox, leprosy and tuberculosis), the very high death-rate (24 per 1,000 population in 1938), the low level of literacy (12 2 per cent in 1941) and the many other very obvious social ills naturally and properly troubled the consciences and even raised the anger of English-educated Indians. It was implicit in the conditions that British rule and British capitalists should not be praised for what they had done but should be blamed for what they had not done In the emotional environment thus created the inherent difficulties were minimized if not ignored, and in the opinions of the great mass of English-educated Indians the conditions supplied an irrefutable argument for the transfer of power to Indian hands.

The argument was, however, based mainly on political grounds. The political philosophy taught in the schools and universities was derived not from Sanskrit texts or the Quran but from Great Britain. Until 1835 the East India Company had subsidized education in Sanskrit, but there was already a demand for English education which Macaulay's famous Minute of that year had clinched. Thenceforth English education proceeded apace The constitutional history taught in India was that of England, the country in which representative and responsible government had been developed. If it was

good for Englishmen to govern themselves—and Whig history suggested that it was—it was equally good for Indians to govern themselves. When the British had refused to allow self-government to the American colonies the colonists had rebelled, and the language of Chatham and Burke, as studied in India, seemed to imply that Indians also should govern themselves. In the nineteenth century the colonies of North America, Australasia and South Africa had obtained self-government and British publicists appeared to rejoice in the fact; but there was no self-government for India

Another set of publicists provided the reason J. A Hobson showed in his *Imperialism* the connection between Empire and profits, colonies and investments. It became an axiom of Radical thought that the Conservative interest in the Empire was based on economic motives, and the products of the Radical presses were read in India. India, it was believed, was the brightest jewel in the Crown because her toiling millions provided with the sweat of their emaciated bodies the means for all the glory of Empire. With the dawn of the twentieth century, too, came the Labour Movement with its theory of equality of opportunity. Sidney and Beatrice Webb, George Bernard Shaw, Harold Laski and G D. H. Cole were among the prophets; and at a later stage the yellow covers of the publishing house of Victor Gollancz held a prominent place in every bookstall in India In short, English education spelled Indian independence. The British could maintain autocracy in India, while democracy and equality were being advocated in Britain, only by closing the schools and universities and forbidding the spread of the English language

Already, in 1820, there were schools or colleges in Calcutta, Bombay, Madras and Agra. Until Macaulay's Minute of 1835, however, the Company gave no assistance towards English education In 1854 a general policy for elementary education in the vernacular, higher education in English and university education as then organized in London was laid down in a despatch from the Board of Control There was, however, little money available, with the result that the main development

was in fee-levying schools and colleges using English as medium The fees were necessarily low and the education correspondingly poor Quality was sacrificed to quantity Also, the three universities of Bombay, Calcutta and Madras which were founded in 1857 were mere examining bodies like their prototype, the University of London. Nor was there an Oxford or a Cambridge to set a standard Their students came from poorly staffed and poorly equipped secondary schools in which emphasis was laid not on education but on the passing of public examinations They proceeded to poorly staffed and poorly equipped colleges, where again the emphasis was upon public examinations

The most serious complaints against British rule, apart from the delay in conferring self-government, were that insufficient attention was paid to the education of the masses through the vernaculars and that the English education provided was of a poor quality. The comparatively few who could overcome the defects of their earlier education were as good as, if not better than, the scholars of the West, but even in the present century, when the defects were realized by the Indians themselves and efforts made to overcome them, the proportion of real scholars was distressingly small. The defects of the system of public examinations are evident enough in Britain, but they were multiplied a hundredfold in a country whose ancient tradition of learning had virtually disappeared and had been replaced not by the best type of English education but by its worst. Indian students, especially Hindu students, proved adept at passing examinations, though even examination standards were kept low by the need for fees, but their knowledge tended to be as superficial as all mere examination knowledge must be, and few were given the opportunity to obtain that broad training of mind and character which the best English education could have provided.

It has also to be noticed that the Hindus took more readily to English education than the Muslims. Islam is essentially conservative. Purdah, though widely practised among the Hindus, has for them no religious sanction; it was, therefore,

more easily given up The boy who starts with a deficient home education, however, suffers from a handicap which he cannot easily overcome Also, the task of learning to recite the Quran in Arabic occupies much of his time and energy and places a great strain upon his intellect at an age when he ought to be laying the foundation of his education in his vernacular These difficulties multiply in geometrical progression, for those who sought English education were often the sons and daughters of public servants and others who had already some measure of English education The result was that the Muslims, who under the Moghuls had governed India, became a backward community. The tensions which this differentiation set up were in some measure responsible for the communal problem. Among Hindus in 1931 the literates were 8 4 per cent, while among Mussulmans the percentage was only 6 4 per cent; and these figures give little indication of the distribution of English education

The communal problem was, however, essentially religious or economic, not 'racial' The several 'races' created by the successive invasions and by the survival of different languages managed to live together in harmony The Dravidian-speaking peoples of the south had no conflict with the Aryan peoples of the north There were, it is true, occasional demands for a 'Dravidistan', and the recent development of racial theories also tended both towards a provincial particularism—which would divide Dravidistan into four parts—and towards a system of preferences based on language or even caste The separation of the Muslim provinces into Pakistan has caused these elements of differentiation to become more important, also, there is danger inherent in the growing use of the vernaculars for higher education, for it implies the disintegration of the English-educated middle class which has done so much to unify Indian opinion On the other hand, the Mussulmans are not a separate 'race'. Though many of them had Arab, Turk or Moghul ancestors, the invaders married Indian wives and their progeny differ only in religion from their Hindu compatriots What is more, Islam achieved its usual success

as a proselytizing religion, so that many Mussulmans are the descendants of converted Hindus. The principal language of the Muslims, Urdu, is merely a variety of Hindi, using Arabic script and being somewhat more impregnated by Arabic and Persian borrowings.

To describe the Hindu-Muslim conflict as a conflict of religions is not, however, wholly accurate Both Hinduism and Islam are ways of life prescribing not merely forms of worship and moral behaviour but family relationships and wider social relationships, including legal relationships. Neither knows the distinction between the religious and the secular which is common form in the West It is therefore not practicable to keep religion out of politics, for in large measure both are concerned with the same problems.

The origin of Hinduism is obscure because it preceded recorded history. The fact that it is Dravidian as well as Aryan may lead to the surmise that the whole of India was once Dravidian and that the Aryan invaders adopted Hinduism when they settled down in India On the other hand, the sacred texts are in Sanskrit and most of the holy places in the north. The caste system was recognized in the earliest texts, though it was neither so complex nor so rigid as it became in later generations. At one stage Hinduism seemed likely to be superseded by Buddhism, whose origin we may place at the traditional (though probably incorrect) date of 543 B.C., but when Buddhism ceased to enjoy royal patronage it decayed no doubt mainly because it would have compelled a reorganization of Hindu social life, and for our present purposes the most significant historical factor is that it spread to, and remained in, Ceylon

The Hindu way of life or *dharma* is laid down in the sacred texts, which perhaps began about 800 B C and continued for at least 2,000 years. Its theological and philosophical aspects we need not attempt to summarize, though it must be emphasized that the social system which results is dependent on them. The two fundamental and peculiar characteristics of Hindu social life are the joint family and the caste system.

The joint family is a system whereby the land is vested not in one person but in the whole family, which includes sons and their families (or, in some areas where matriarchy prevails, daughters and their families) It has some admirable features in that it provides for the maintenance of the sick, the lame, the blind, the mentally deficient, the aged and the unemployed without the intervention of the State These obligations continue, as moral obligations, even where the joint family system as a form of landholding has ceased to operate and the sons (or daughters) have set up house for themselves What is more, there is a social obligation to help in the education of nephews if not of nieces also· and this has done much for the spread of English education, because when one member of the family has reached the economic level at which the cost of fees and maintenance can be borne, he may be the means of bringing the whole family to that level. If the uncles can find the fees and the eldest son can pass the necessary examinations, he can hope for a place in the public service or elsewhere where his income will be large enough to educate his brothers and perhaps even his cousins To this end the family will incur hardships and mortgage its lands On the other hand, this emphasis in the family converts nepotism from a vice to a virtue The family obligation is the social obligation which takes precedence over all others. Combined with the caste system, it has made extremely difficult the development of a social conscience or a sense of social solidarity.

The caste system may be a development from the joint family system, like the clan, but clearly other ideas have been at work In its fully developed form it has four aspects. First, it is a rule about marriage A person may not marry outside his caste or, where the caste has been subdivided, outside his sub-caste. This rule is still broken but rarely Secondly, the castes and sub-castes have generally been associated with particular classes of employment, so that sons follow the occupations of their fathers This rule has never been absolute and has completely broken down among the English-educated classes. Thirdly, there are customs relating to the preparation

and use of food and drink which compel social segregation for these purposes. This rule also has broken down in the educated classes, except among the more conservative Brahmins. Finally, there is in theory at least a sense of fellowship among members of the same caste, though more often it operates to segregate the castes so that, for instance, a man of one caste will not go to live in a village where there are no other members of his caste.

The caste system operates most harshly in relation to what used to be called the untouchables and are now known as the special castes. Of these there are some sixty million throughout India. Until recently they were not allowed to use the same roads, draw water from the same wells, worship in the same temples, send their children to the same schools, or be cremated in the same cemeteries, as those of the higher castes. They were thus completely segregated from the rest of Hindu civilization, and only the Christians and the Mussulmans, who denied the whole theory of caste, offered the Harijans relief from their disabilities. This fact, and the fact that they have become politically important, has given added strength to the case which the socially conscious caste Hindus had already made against the whole caste system. The abolition of the disabilities of the Harijans had been one of Mahatma Gandhi's major objectives, and his campaign, which was generally supported by the Indian National Congress, achieved a large measure of success.

The comparison which educated Hindus sometimes make between the caste system and the class system is not accurate. It is true that in the West people do not usually marry outside their own class, but nobody is 'declassed' if he does. It is true, too, that there are differences of costume and accent, but a person can change both. The classes are in a constant state of flux. Economic and educational opportunities are available for those at the lowest economic levels to rise to the top, while those at the top can sink to the bottom either slowly or rapidly. Actually, India has a class system, more pronounced than that of Europe, superimposed on the caste system. The range of incomes in Government service, industry or commerce

is wider in India than in England, while knowledge of English is a class distinction which creates a formidable barrier. It is more difficult to rise in the social scale in India than in England because it is more difficult to obtain educational qualifications, but it is of course happening constantly, whereas no person can rise out of his caste.

Since there are some 3,000 castes and sub-castes, the general effect of the Hindu social system is fragmentation In one aspect this minimizes the religious conflict, for while (as will be seen) Islam tends to unite the Mussulmans, Hinduism does not unite the Hindus On the other hand, it prevents the growth of the sense of solidarity which is the foundation of citizenship The Indian National Congress and other social reformers had done much to diminish caste differences and integrate the people, though they were more successful in creating Hindu opinion than in creating Indian opinion An even more determined attempt has been made under the Constitution of India

Islam like Christianity is a religion which in theory accepts the equality of all true believers. Mussulmans, as the phrase goes, are brothers in Islam Like early Christianity, too, Islam had difficulty in accepting the principle of toleration If there is one God and Muhammad is his Prophet, how can believers tolerate the many gods of Hinduism?

It is clear enough that in the invasions of the seventh and eighth centuries, when the Arabs conquered Baluchistan, Sind and the Punjab in the name of Allah and on behalf of the Khalifa of Baghdad, there was little toleration. The men among the conquered people either accepted Islam or were destroyed, while the women and children were booty of war. In course of time, however, the Mussulmans extended to Hindus the toleration shown to Jews and Christians they were allowed to retain their religion provided that they paid poll-tax. At a later stage, indeed, Hindu kingdoms could remain in being, provided that tribute was paid. It thus became possible for Hinduism to retain its strength even in the Moghul Empire and for Hindus and Mussulmans to live side by side.

Even when forced conversion virtually disappeared, however, voluntary conversions were numerous, particularly in the Indus Plain where Muslim influence was greatest and in Eastern Bengal These are the areas which have now become Pakistan; and though it is true that the ancestry of the people of Western Pakistan is even more mixed than that of the rest of India, there is no fundamental ethnological difference Moreover, conversion whether forced or voluntary did not produce a fundamental change from the Hindu to the Muslim way of life. Whole families and even castes were converted without any genuine understanding of the Islamic faith and the converts carried with their new faith some of the social ideas of Hinduism. These ideas include those of caste, and though there are no untouchables in Islam many uneducated Mussulmans maintain the same caste divisions as their Hindu neighbours To some extent, therefore, the brotherhood of Islam was long ago broken up

The differences between Islam and Hinduism are therefore not so great as to prevent Mussulmans and Hindus from living in close proximity. On the other hand, they are sufficiently great to be obvious. The Mussulmans are indeed brothers in Islam, ready to help each other in trouble and in some measure looking down on their Hindu neighbours whose close family and caste organization impels segregation. The purdah system of Islam has been adopted by many Hindus and adds to the difficulty of intercourse caused by caste observances. Disputes generally arise through quite trivial causes To the Hindu the cow is sacred. For the Mussulmans there are occasions when religion is thought to require the sacrifice of a cow Again, Hindus and Muslims generally enjoy each other's festivals; but there are occasions when Hindu and Muslim festivals coincide and when Hindu music is played outside a mosque in such a manner as to rouse antagonism among the Muslims. If, for either of these reasons, or for any other, passions are stirred, the differentiation in the way of life and the segregation which social practices produce may result in a trivial dispute becoming a flaming controversy

in which blood is shed. Adequate precautions are usually taken, but if they are not large-scale rioting may result.

Rioting of this character was, so to speak, endemic, though it was sometimes instigated by designing politicians; but it need not have resulted in communal controversy at a political level, for it always occurred among the uneducated The communal rivalry was founded on the different social conventions of Islam and Hinduism, but it was built up among the educated classes through different causes arising out of the political development of the Indian peoples.

When Macaulay, as Secretary to the Board of Control, spoke on the Indian Councils Bill of 1833, he expressed the hope that one day India would have 'European institutions'. Whenever that day came, he added, 'it will be the proudest day for English history'. The proudest day, on this computation, was 15th August, 1947, when the Dominions of India and Pakistan were created. It cannot be alleged, however, that the efforts of Great Britain were concentrated on achieving this consummation. Even as late as 1909 it was doubted whether the structure of Indian society would ever permit of responsible government Lord Kimberley, who had been Secretary of State for India, called the idea 'one of the wildest imaginations that ever entered the minds of men' Lord Morley, who was responsible for the reforms of 1909, said much the same in public In private, as was his way, he hedged a little He was prepared to agree that the ultimate hope and design was for India to be a self-governing colony, but for many a day to come it was 'a mere dream' It was not until 1917 that His Majesty's Government laid down as its policy that of 'the increasing association of Indians in every branch of the administration and the gradual development of self-governing institutions with a view to the progressive realization of responsible government in India as an integral part of the British Empire'

The policy of responsible government by evolution was thus adopted only in 1917, but it had been implicit in the conditions of government since 1835. The introduction of

western education and the English language, the removal of all restrictions on the Press save the ordinary laws of sedition and libel, the establishment of the right of public meeting, and generally the creation of a free environment such as Great Britain and the Dominions enjoyed, necessarily produced a demand, which could not be refused, for the other half of freedom, self-government. The peculiar conditions of Indian social life, and especially the fragmentation of her peoples by religion, race, caste and language, did no more than retard the development; the fundamental decisions were taken in 1835 and 1854 when western education and the English language were introduced.

The fundamental problem, indeed, was not the objective but the rate of evolution. On this point the Government of India and the new English-educated middle class necessarily differed. The Government of India was conscious of the difficulties in a country where the great mass of the population had an abominably low economic level, was completely illiterate, steeped in superstition (for the philosophies of Hinduism and Islam did not touch the mass of the people), and capable of upsetting law and order for causes which seemed trivial. To the English-educated Indians, on the other hand, these facts tended to prove that government should be in the hands of those who understood the people and had every incentive to remove these distressing conditions. The policy of self-government by evolution inevitably aroused an antagonism between those who governed and those who wanted to govern and who thought, indeed, that they had the right to govern.

Since 1885 the most prominent organ of Indian opinion was the Indian National Congress. At first it was a patriotic organization of the English-educated, working for constitutional reforms by legal means. It asked for no more than higher Indian representation in the Legislative Councils and the public services; but from 1904 to 1916 it adopted the policy of Dominion status by evolution. In its earlier phase it contained members of all communities, and at no stage

was it an exclusively Hindu body. Nevertheless, it was suspected by many Muslims from the beginning In its early years Sir Syed Ahmad Khan warned the Mussulmans that majority rule in any form meant, in Indian conditions, Hindu rule The leftward swing of the Congress in the early years of the present century induced a number of Muslim leaders to form, in 1906, the All-India Muslim League, which occasionally reached agreement with the Congress but generally was opposed to it

At the beginning of the present century the younger men, especially in the universities, became impatient with the reformism of the Congress and, led by B G Tilak, began to demand action instead of what Tilak called 'mendicancy', the begging of reforms from the Raj The Morley-Minto reforms of 1909 strengthened the hands of the older men, but they were defeated by the militancy inspired by the war of 1914–18, and in 1916 the left wing gained control while the older leaders resigned to form a new organization, the National Liberal Party, a small but influential body

The war with Turkey, whose Sultan was Caliph of Islam, and the influence of the younger men also changed the policy of the Muslim League. In 1916 an agreement was reached between the Congress and the League by which the Congress conceded the principle of seats reserved for minorities (communal representation) and the League accepted a large instalment of self-government. This provided a favourable environment for the announcement of 1917 but whereas the Raj assumed the development of responsible government by slow stages, the Congress expected a rapid transfer of power In 1918 the Congress asked for a statutory guarantee that full responsible government would be accorded within fifteen years.

Meanwhile Mr. M K. Gandhi, usually known as Mahatma Gandhi, had returned from South Africa. After practising as a barrister in India he had gone to South Africa in 1893 in connection with a lawsuit, and had been so affected by the colour prejudice of that country that he had remained to fight the battles of the Indian community. While reading

for the English Bar he had been profoundly influenced by religious studies, Christian and Muslim as well as Hindu, and made it his ideal to live 'like a bare spirit in its low prison of flesh'. He thus became a fighting politician who scorned to fight, and in his final battle, which lasted eight years, against the humiliating restrictions of the South African Asiatic Act he developed the technique of *satyagraha*, passive resistance or 'non-violent non-co-operation'. His campaign being successful in 1914, he returned to India famous both as a saint and as a politician.

In the troubles of the war and the post-war period, the Mahatma preached and practised his own solutions, and by 1920 his ideas dominated the Congress. In 1921 the objective of Dominion status was rejected and the new aim was declared to be 'the attainment of *Swarajya* by the people of India by all legitimate and peaceful means'. 'Legitimate', in practice, usually meant passive resistance to the law, and though the actions of the Mahatma and the Congress leaders were peaceful or at least passive, they generally resulted in disorder and violence The Congress had in fact become a revolutionary body, conducting its revolution by passive disobedience What is more, it had ceased to be an organization only of the English-educated and was based essentially on the mass support of millions of Hindus

The Montagu-Chelmsford reforms which took effect in 1921 were at first welcomed by the Mahatma, but very soon he changed his mind and under his influence the Congress boycotted the elections. The Liberals accepted office in the new semi-self-governing Provincial legislatures and the new Constitution worked reasonably well except where, in and after 1923, the Congress fought and won the elections in order to prevent it from working. The Muslim League, now led by M. A. Jinnah, followed a policy in general agreement with that of the Congress, and indeed the Mahatma made every effort to persuade the Congress and the League to come to terms In fact, however, there was throughout the parts of India where the Muslims were strong a struggle for power between

Muslims and Hindus and there were frequent communal riots. The communal situation was worse in 1928 than in 1918. Civil disobedience proved once more that if some parts of the law are not observed the basis of law and order disappears.

Even so, the position was not quite hopeless. A small but representative committee under Pandit Motilal Nehru produced, in 1928, a report which went near to securing agreement. Eventually, however, the Congress hedged and the Muslim League then rejected it. It is possible, though improbable, that if at this stage the Government of India had acted as mediator an agreed scheme might have proved acceptable At this time, however, neither the Government of India nor the Imperial Government had decided that the time for complete, or almost complete, self-government had arrived. The Act of 1919 had prescribed that after ten years the constitutional problem should be re-examined by a statutory commission. In 1927 it was decided to appoint the commission immediately. Its members were drawn entirely from the Imperial Parliament, and the appointment thus gave renewed offence. The publication of the report of the Simon Commission was followed by a Round Table Conference in London, and the Congress was represented by Mahatma Gandhi at the second session He failed to secure agreement with the minorities on the communal question, which was settled for the time being by an award of the Prime Minister On it and on the discussions of the Conference was based the Act of 1935, which gave self-government subject to safeguards in the Provinces and a division of power between Ministers and officials at the centre. The federal scheme was, however, subject to acceptance by the States, and, since they did not accede, it never came into operation.

In August, 1940, just before the Battle of Britain, a new offer was made to India through the Viceroy. It offered a constituent assembly, but on such conditions that it was immediately repudiated by the Congress and was not welcomed by anybody, though the Muslim League welcomed the declaration about minorities which was especially objectionable to the

Congress. In October, while London was being bombed, *satyagraha* was begun again under the Mahatma's direction, though it was kept within narrow limits so as not to embarrass the war effort, and in fact did not embarrass anybody except the *satyagrahis*

On the Japanese approach to India in 1942 a new effort was made Four days after the fall of Rangoon, Mr. Winston Churchill announced that the War Cabinet had reached a unanimous decision on India and that Sir Stafford Cripps would leave for India to negotiate personally. The offer made was that an Indian Union should be formed with full Dominion status, including power to secede from the Commonwealth, that a constituent assembly should be set up immediately on the cessation of hostilities, that the British Government would accept the constitution so drafted on two conditions first that any Provinces not willing to accept the Constitution should have power to form a Dominion of their own, and secondly that a treaty for the transfer of power and the protection of minorities should be settled; and that while defence would remain in the hands of the United Kingdom until the Constitution came into operation the co-operation of the leaders of opinion would be sought

It is necessary at this stage to leave the Congress and to look at the attitude of the Muslim League The Congress had become a party based on the support of the masses. At the elections under the Act of 1935 it had obtained a majority in seven of the Provinces. It was convinced that it represented the nation It was therefore little inclined to compromise on the communal issue. Communalism would disappear once British rule was ended, for it was the product of the British plan to 'divide and rule'. This attitude naturally brought the Muslim League into opposition, what is more, Muslim opinion was consolidated and the League became the Islamic bulwark against the 'Congress Raj', which was alleged to be much the same as a Hindu Raj. By 1938 the League was strong enough to claim that it alone represented Muslim India. At the end of the year Mr. Jinnah claimed that there was a worse enemy

than British imperialism—Congress fascism. What is more, the League began to complain of Muslim grievances in Congress Provinces. It was now alleged that 'divide and rule' was Congress policy.

Simultaneously, the Congress was being attacked from the other side The Hindu Mahasabha had been founded in 1928 as a purely cultural organization By 1937 it had become a political body and was attacking the Congress because it was trying to be a non-communal body The Mahasabha agreed with the League that a united bi-communal India was a figment of the imagination. India was Hindustan, a Hindu country in which the Muslims and other minorities should be treated justly.

It was in this atmosphere that the idea of Pakistan was adopted as official League policy The idea of separating the Muslim Provinces of the North-West had been developed in 1930 The idea of federating the Punjab, the North-West Frontier Province (or Afghan Province), Kashmir, Sind and Baluchistan had been elaborated by a group of young Indians in England during the Round Table Conference It was based on the assumption that India contained not one nation but two nations, the one Hindu, the other Muslim Accordingly, the Pakistan Provinces should form a separate independent State. There was much literary discussion in the next decade. The doctrine of the 'two nations' was gradually accepted by League opinion and in 1940 a somewhat vague League resolution used the phrase 'independent States' for North-West and North-East India, though it was clear that some organic connection with Hindustan was contemplated At this stage, therefore, the 'two nation' theory and Pakistan became the official policy of the League, though its meaning was deliberately left vague

To meet this demand, the Cripps offer provided for any Province or Provinces to secede from the Dominion of India and form a separate Dominion This provision and the provision relating to the States gave reason to the Congress to reject the offer Thereupon the League also rejected the offer because, though Pakistan was accepted by implication, its primary object was to create an Indian Union. It is however

reasonably certain that agreement could have been reached if the Congress had been willing to accept the Cripps plan of an interim National Government. What they wanted was an immediate constitutional change, conferring full responsible government by law, a change which, in the opinion of the British Government, was impracticable at that stage of the war. The Congress was perhaps true to its ideology in asking for everything at once, but in fact it would have had long before 1947 a scheme more favourable to the Congress point of view than that ultimately adopted by agreement.

The immediate result of the rejection of the Cripps offer was an intensification of controversy. The League attacked the Congress and the Congress defended itself by attacking the British. The All-India Congress Committee flatly repudiated 'any proposal to disintegrate India by giving liberty to any component State or territorial unit to secede from the Indian Union or Federation'. Later the Working Committee, under Mahatma Gandhi's influence, demanded British withdrawal, since it was the presence of the British which frustrated communal agreement A provisional Government would then be formed to evolve a scheme for a Constituent Assembly. Representatives of free India would negotiate with Great Britain, would adjust future relations and enable the two countries to co-operate as allies If this 'very reasonable and just proposal' was not accepted the Congress would have to have recourse to non-violence under the Mahatma's leadership. The resolution having been approved by the All-India Congress Committee, the Mahatma and many other Congress leaders were arrested, but the 'rebellion' had been organized in depth and disorder broke out simultaneously, in accordance with a coherent plan, in many parts of India. It was put down with a loss of 940 lives There was fortunately no communal trouble. Mahatma Gandhi had tried to persuade the Muslim League to combine with the Congress in his attack on British rule. The League's response was to declare that the Congress aim was to coerce the British Government into handing power to a Hindu oligarchy and to compel the Mussulmans to

submit to Congress dictation. Accordingly, Muslims were enjoined to take no part in the Congress movement but to pursue their normal peaceful life. The instruction was observed.

It was now clear that the Congress plan of a united India was impracticable unless agreement with the Muslim League could be reached. In 1944 there were long but fruitless negotiations between Mahatma Gandhi and Mr. Jinnah. In 1945 an unofficial committee under Sir Tej Bahadur Sapru, a Liberal leader of long experience and considerable popularity, produced an interesting but still-born report. In the same year the new Viceroy, Lord Wavell, produced a new interim plan for a 'balanced' central Cabinet containing equal representation for Muslims and 'caste' Hindus. A conference was summoned to Simla to work out the details, but it broke down because the League insisted that all the Muslim members should be nominated by the League. Soon afterwards the war in Europe ended and the Labour Government made another effort. In March, 1946, a Cabinet Mission was sent to India with the intention of securing an agreement 'upon the fundamental issue of the unity or division of India'. Both sides agreed to concessions, but it was impossible to bridge the gap. The League insisted that the six 'Muslim Provinces' (Punjab, North-West Frontier, Baluchistan, Sind, Bengal and Assam) be grouped together under one constituent assembly and the 'Hindu Provinces' under another and that the two bodies sit together for dealing with Foreign Affairs, Defence and Communications necessary for Defence. The Congress wanted a single constituent assembly to deal with Foreign Affairs, Defence, Communications, Fundamental Rights, Customs and Planning. All remaining powers were to be vested in Provinces which might for this purpose combine in groups. The Cabinet Mission then put forward its own scheme, which was rejected by both sides.

Finally, in 1947, an interim Government was formed, with Lord Mountbatten as Viceroy and titular President. A complicated scheme was agreed whereby Sind, Baluchistan, North-West Frontier Province, West Punjab and East Bengal

(with the Sylhet District of Assam) became 'Pakistan' and the remainder became 'India', under separate constituent assemblies and with their own governments. Power was transferred by the Indian Independence Act, 1947, which created the Dominions of India and Pakistan. There was, of course, implied in this Dominion status a right of secession from the British Commonwealth.

The Congress thus accepted in 1947 a scheme which was less favourable to the Congress thesis than the 'August offer' of 1940, the Cripps plan of 1942, and the Cabinet Mission's proposals of 1946. The British Government, after seven years of intensive effort, had produced an acceptable plan to 'quit India'. Whether, after the thirty years of controversy and propaganda, the psychological foundations necessary for continued membership of the Commonwealth by India and Pakistan existed was at first doubtful.

The Union of India

The Union of India includes the whole of British India except the Provinces of Sind, Baluchistan and the North-West Frontier and parts of the Provinces of the Punjab, Bengal and Assam. It also includes nearly all the former Indian States. A great simplification of the structure was effected in two phases, the first before the Constitution of 1950 was enacted and the second by constitutional amendment in 1956. The main aim of the changes in 1956 was to produce linguistic States, i.e. States in which particular Indian languages could generally be used for purposes of administration In consequence of further agitation in 1960, two new linguistic States were created out of the State of Bombay. There are now fifteen States, namely Andhra Pradesh (Telegu), Assam (Assamese), Bihar (Hindi), Gujerat (Gujerati), Kerala (Malayalam), Madhya Pradesh (Hindi), Madras (Tamil), Maharashtra (Marathi), Mysore (Kannada), Orissa (Oriya), Punjab (Punjabi), Rajasthan (Hindi), Uttar Pradesh (Hindi), West Bengal (Bengali), and Jammu and Kashmir (Kashmiri). There are also six small 'Union territories' which are, in

effect, governed by the Union Government The total of the land area is nearly 1,140,000 square miles and the population is more than 400 million, by far the largest unit in the Commonwealth.

The Constitution was worked out by the Constituent Assembly and came into operation in 1950. It is an extraordinarily long and complicated document, for several reasons. First, it is based on the Government of India Act, 1935, the largest Act ever framed by the Parliament of the United Kingdom Since the Act set up a new administrative structure for a continent, it was necessarily detailed, and the example has been followed. Secondly, the variety of States compelled a complicated organization. Thirdly, it was necessary to provide new Constitutions for the States as well as for the Union Fourthly, the Constitution contains not only a complicated series of Fundamental Rights but also a series of Directives of Social Policy which seek to indicate the manner in which the policy of the Union Government should develop Finally there is implicit in the Constitution a distrust of governmental action which obviously derives from the experience of the Congress politicians under British rule and which has led to drafting in far greater detail than is customary in Constitutions.

The organization is federal, with powers divided between the Union Parliament and the legislatures of the States. The division, like that of the Government of India Act, 1935, and unlike those in Canada and Australia, goes into great detail, and so far, at least, the problem for the judicial authorities has been not to distribute powers between the Union and the States but to interpret the severe limitations imposed by the Bill of Rights. Indeed, it proved necessary to amend the Bill of Rights even before it came into operation. There are three classes of legislative powers, Union, concurrent and State Speaking generally, the emphasis is upon the Union, in which the residuary power is vested.

The form of government is republican, the President of the Union being elected by an electoral college, derived from the Union and State legislatures, for a term of five years. It is possible, and indeed probable, that there will be a contest for

the office on political lines and it is possible, though in present political conditions not very probable, that the President and the Prime Minister will be drawn from different political parties. The President is, however, for all practical purposes a constitutional monarch, for the Constituent Assembly has enacted a system of responsible government similar in principle to that in the United Kingdom, Canada and Australia. It should be said, however, that this arises by implication, for the President has been given the same powers as the Queen in the United Kingdom or the Queen and the Governor-General in Canada or Australia. The Queen and the Governor-General are bound by constitutional convention to exercise their powers in accordance with well-known principles. there is, however, no provision in India (as there is in Ceylon) to that effect, and though the present President is acting as a constitutional monarch there is no way of compelling his successors to do so. Though the President could be impeached for illegal acts, he would not act illegally if he decided to exercise his powers in opposition to the Union Government, short of impeachment, he cannot be removed during his term of office.

Assuming, however, that the President will follow the precedents laid down in the other independent countries of the Commonwealth, the creation of the republic is purely a matter of form. The Constitution would have worked in exactly the same way if the theoretical powers of the Queen had been retained and were exercised by a Governor-General appointed by her on the advice of the Union Government. The change from monarchy to republic is thus purely formal, a demonstration rather than a change of substance, due no doubt to the long conflict between the Indian National Congress and the Government of the King-Emperor. The change would have been necessary if India, like Burma, had decided to leave the Commonwealth It was, however, decided to remain within the Commonwealth if India's relationship to the Commonwealth under a republican form of Government could be maintained At a conference of Prime Ministers in October, 1949, a formula was devised to make this possible. India

recognizes the Queen not as Queen but as 'Head of the Commonwealth', while other countries recognize her both as Queen and as Head of the Commonwealth.

The Constitutions of the States, like that of the Union of India, are based upon the British Constitution. In each of them there is a Governor whose Government, headed by the Chief Minister, is responsible to the legislature, or to the lower house of the legislature where it has two houses. The Government is formed by the Governor, who is appointed by the President, and it was evidently contemplated that the Governor should follow British precedents. Consequently, while there are many differences and the form is republican, the Constitution of India is similar in fundamental principles to those of Canada and Australia.

The separation of Pakistan from India has eased the communal problem by removing the majority of the Muslims and making India predominantly Hindu. There was, too, a vast movement of population, assisted by riots, across the frontier when the separation was brought about. There is still a substantial minority of Muslims in India and about ten million Hindus in Pakistan. The Indian Bill of Rights gives legal protection to minorities and forbids racial or religious discrimination; but so long as disputes exist there is inevitably much social pressure. Also, India and Pakistan have not yet been able to settle the problem of Jammu and Kashmir, which contains some three million Muslims and nearly a million Hindus. The Maharajah, who was a Hindu, acceded to India, and his accession was accepted by India. Armed intervention both from Pakistan and from India followed. The United Nations being seised of the problem was able to arrange an armistice, but no permanent settlement has been reached.

The diversity of India is shown by the fact that, though provision is made for the gradual displacement of English by Hindi as official language, authority is given for the use of no less than fourteen Provincial languages (including Hindi and Sanskrit). Even this is a simplification, for several of the languages are spoken in different dialects. None of the languages

is as yet fully adapted for the purposes of higher education and modern technology. The attainment of independence, the adoption of a new republican Constitution, and the termination of the Hindu-Muslim controversy have given India a national unity such as few could have prophesied, but it is dependent upon the common ideals of the English-educated section of the population, represented politically by the Indian National Congress. Whether this unity can prevail when the States use a dozen different languages is a question on which doubt has been expressed The Government of India is doing its best to meet the problem through the rapid development of Hindi as national language, but it is inevitably difficult to substitute Hindi for English and at the same time so to develop it as to make it flexible enough to serve all the purposes for which English has hitherto been used. Also, whereas English is now (since independence) politically neutral, Hindi is the mother tongue of a section of the population in the valley of the Ganges, and inevitably its adoption as national language gives that section an advantage

The fundamental problem of India, however, is economic Its economy is fundamentally agricultural, and yet a population of four hundred million has to subsist on 1,139,000 square miles, of which a large part is uncultivable. What is more, the population is increasing with great rapidity, the increase being between three and four million per annum A rapid development of industries is needed, but this requires large capital expenditure which a country with a low standard of living finds difficulty in producing because it requires the diversion of a substantial portion of the national income from consumption to capital development. There are substantial deposits of coal in Bengal, Bihar and Orissa and some thirty-five million tons are mined annually. (United Kingdom production is about two hundred and twenty-five million tons) There is no other large source of power except water, and hydroelectric schemes require a large capital expenditure. The production of steel is about a million tons a year and of cement about two million tons a year. Considerable develop-

ments have occurred under the 'five year plans', and India is now considered to be self-sufficient in food. Industrial developments are coming more slowly, but a considerable expansion in capital equipment has resulted from the successive 'five-year plans'.

Pakistan

The Dominion of India took over a machinery of government in full operation. It was merely necessary to bring the public service under democratic control, to bring into full operation legislatures which had already been established, to fill vacancies due to the departure of Europeans and Pakistanis, and to withdraw officials from the Provinces which were incorporated in Pakistan. The Dominion of Pakistan, on the other hand, had to create an entirely new central administration in Karachi Even in the Provinces which were incorporated bodily in Pakistan—Sind, North-West Frontier Province and Baluchistan—new administrations had to be established, since most of the senior officials were Indian. The two most populous Provinces, Punjab and East Bengal, were formed by the division of the corresponding Provinces of pre-partition India and therefore required new administrations

The task was rendered more difficult by the physical separation of East Pakistan (i e East Bengal) from West Pakistan (Sind, North-West Frontier Province, Baluchistan and Punjab) and by the heavy migration of refugees across the frontiers immediately after partition. There were, too, inherent difficulties in producing a new Constitution for a country divided into two parts, with some thirty-three million people in West Pakistan and forty-two million in East Pakistan. Though Urdu is the national language, Bengali is generally spoken in East Pakistan, and the common language is English. The Constituent Assembly, set up in 1947, was in fact unable to make progress until 1953. The scheme then agreed upon was put into the form of a Constitution, but before it could be brought before the Assembly the Assembly itself was dissolved. This act resulted in considerable litigation, but eventually it

was held by the Federal Court that the dissolution was valid, and elections for a new Assembly were held The Muslim League lost its majority, but was able to form a Government in coalition with the United Front from East Bengal. Legislation was then passed to convert the Provinces and States of West Pakistan into a single Province. This made the problem easier. A republican Constitution was approved by the second Constituent Assembly in February, 1956, and the Islamic Republic of Pakistan came into existence on the 23rd March, 1956, with General Iskandar Mirza as President.

The death of the Qaid-i-Islam, M. A Jinnah, in 1948, the assassination of Liaquat Ali Khan in 1951, and the dismissal of Khwaja Nazimuddin in 1953 had, however, broken the Muslim League into fragments and had lost it all support in East Pakistan. The inherent difficulties of governing a divided country without a strong and unified party then became obvious There was delay in enacting an electoral law because of disagreement among the political groups No election had been held when, on the 7th October, 1958, President Iskandar Mirza abrogated the Constitution, dismissed the Central and Provincial Governments, dissolved the National and Provincial Assemblies, and proclaimed martial law. The President had the support of the Pakistan Army, and General Ayub Khan, Commander-in-Chief, became Martial Law Administrator. Later in the month he was appointed Prime Minister, with a mixed civil and military Cabinet but excluding all former politicians. A few days later President Iskandar Mirza himself resigned, and General (now Field-Marshal) Ayub Khan became President, Prime Minister and Martial Law Administrator.

Ceylon

Ceylon is separated from India by the Palk Strait, some 40 miles wide Though the northern tip, the Jaffna Peninsula, is much like the State of Madras and, indeed, occupied by hard-working Tamils, the remainder of the Island is a green and pleasant land, enjoying an equable climate tempered by the seas that wash her palm-fringed coasts. The west coast

and the western slopes of the central hills receive rain by both monsoons, so that paddy, fruit, vegetables and coconuts flourish in the lowlands, rubber in the steamy valleys and tea on the hill-sides. Much of the rest of the Island is jungle, though in the great days of Sinhalese civilization much of it was cultivated under vast 'tanks' or reservoirs which impounded the rain of the north-east monsoon and the water of the Mahaweli-ganga, the great river that rises near Adam's Peak and pours into the Bay of Bengal at Trincomalee

The people of the coastal belt and the villagers of the hills are Sinhalese Their language is Aryan and the tradition that they came from the Ganges valley by way of the sea is probably correct Almost certainly, however, their Aryan ancestors intermarried with earlier inhabitants, represented until recently by the Veddahs or hunters of the jungle, and possibly there were Dravidians before them There is also a considerable Dravidian strain due to invasions from south India and numerous more peaceful contacts The people of the coastal belt, too, have been subjected to the influence of all the maritime nations who have left their impress not only on the language but also on the biological inheritance of the Sinhalese In short, the Sinhalese 'race' is as mixed as the English, if not more so Any difficulties that this mixture might cause is overcome by the polite fiction that if the father is Sinhalese the offspring are Sinhalese whatever the mother may be. Since the Ceylon Tamils, the Moors and the Malays, though not the Europeans, follow the same rule, the 'racial' division is maintained, the only people of 'mixed blood' are those resulting from intermarriage between European males and Sinhalese or Tamil females, and their number is small

The Arabs came as traders and settled down in the island, so creating the Muslim community of the 'Moors', though there has also been a considerable infiltration from the west coast of India which has made Tamil their usual language. The Malays are descended from the men who came in Dutch and British Malay regiments Both Moors and Malays follow the social system as well as the religion of Islam, but since

they number only half a million they have necessarily been able to adapt themselves more readily to their environment The Ceylon Tamils have kept their Dravidian language and (except in so far as they have become Christians) their Hindu religion and social system, though the caste divisions are less numerous than in India. The Sinhalese are Buddhists except where, as on the coast, they have become Christian. Buddhism does not recognize caste in principle, but does in practice. There is very little left of ancient Sinhalese culture, but it was essentially Indian in texture, and the Sinhalese way of life is not essentially different from the Hindu. Consequently, Ceylon has not the fundamental social division which has been so troublesome in India. The communities are very distinct because language causes a barrier and intermarriage (except among Burghers or Eurasians) is rare.

Also, Ceylon is much more westernized than India. English is the spoken and written language of the whole of the middle class, though most can also speak (if not read and write) either Sinhalese or Tamil. The earliest 'English' schools still in existence were founded in 1822 and there has been a rapid increase in 'English education' in the last sixty years These schools are 'English' not only in language but also in organization and curriculum. The London and Cambridge examinations dominated the teaching until 1943. Since the early years of the century London external degree examinations have been held in the island. A University College, teaching on the London syllabuses, was founded in 1921 The establishment of a university was delayed by controversies over its nature and site. Though the delay had some serious consequences, it resulted in the adoption by Ceylon of modern English standards, and indeed its organization is much like that of the modern English universities. It follows that educational standards are higher in Ceylon than in India The standard of literacy also is much higher, being about 60 per cent as compared with India's 18½ per cent.

This is partly a reflection of the higher standard of living due mainly to heavy investment in tea, rubber and coconuts,

the island's main products Eighty per cent of the tea industry and about 50 per cent of the rubber industry was in non-Ceylonese hands, while much of the labour employed in those industries was drawn from south India. Some of this has become domiciled, while the remainder has maintained its relations with south India. A distinction is, however, still drawn between the Ceylon Tamils of Jaffna and the Indian Tamils of the estates and Colombo

The population exceeds nine million, the great majority being engaged in agriculture on the coastal belt and in Jaffna. Two-thirds are Sinhalese, the remainder being divided almost equally among the Ceylon Tamils, the Indian Tamils and the Muslims. The Ceylon Tamils are, however, concentrated mainly in the Northern and Eastern Provinces, the Indian Tamils are mainly on the estates, among which are interspersed Sinhalese villages; and the Muslims are scattered all over the island.

The Portuguese arrived in Ceylon in 1505 and extended their jurisdiction over the whole of the low-country, including the Jaffna Peninsula. As in India they intermarried with, and in many respects adopted the ways of, the Ceylonese. In consequence a large number of Portuguese words were adopted into colloquial Sinhalese, and it is probable that some of the differences between the low-country Sinhalese and the Kandyan Sinhalese (who maintained their independence in the hills) are due to the stimulus of intermarriage. The wide prevalence of Portuguese names is due in the main, however, to deliberate adoption on baptism into the Christian faith Even in living memory there were villages, now described as Sinhalese, in which a corrupt Portuguese was spoken In spite of persecution under the Dutch, too, the Roman Catholics are the most numerous of the Christians both among the Sinhalese and among the Tamils.

As in India, the Portuguese came to rely more and more on the Eurasian population for the government of the island, and the Dutch had little difficulty in taking over all the Portuguese possessions after the fall of Colombo in 1656 The Dutch were interested primarily in trade and made no attempt to capture

the Kandyan kingdom As in Java, however, their officials were encouraged to settle in the island In many cases, though not in all, they intermarried with the Sinhalese, so that it is not possible to draw a clear distinction between the Burghers and the Eurasians Indeed, the phrase 'Portuguese Burgher' is sometimes used to describe a Eurasian of Portuguese ancestry The Dutch also left behind a system of canals in the low-country and the Roman-Dutch Law, which was extended to the Kandyan Provinces under British rule but much modified all over the island by English law.

During the war with France, while the Netherlands were under French control, there was a fear that Trincomalee would be occupied as a base by the French fleet and used for attacks on British commerce with India In 1795 it was occupied by the British, and by 1796 all the Dutch possessions in Ceylon had passed into British hands They were at first attached to the Madras Presidency, but after the Treaty of Amiens had confirmed British rule in 1802, Ceylon became a Crown Colony. There were early troubles with Kandy and in 1815, when a British force was sent there, the Nayakkar King of Kandy was captured and sent to India. The Kandyan Convention of that year, made with the Kandyan chiefs, vested the Kandyan Territory in His Britannic Majesty The country was not immediately pacified, and there was a rebellion in 1817 and minor disturbances in the years following. In 1833 the Kandyan territory was amalgamated with the rest of the island. The assimilation of the Kandyan Provinces was, however, brought about mainly by the building of roads to replace the jungle tracks and the planting of coffee and tea.

Ceylon was at first governed from Madras, but as soon as British sovereignty was ratified by the Treaty of Amiens it was converted into a Crown Colony with wholly official Legislative and Executive Councils. In 1837 two unofficial members were appointed to the former, by 1845 the number had increased to four, and by 1865 to eight, though an official majority was retained With the spread of English education a demand arose, especially in the twentieth century, for better

representation. In 1910 the Legislative Council was re-formed to contain eleven officials and ten unofficial members, of whom four were elected The riots of 1915 intensified the demand, and in 1919 the nationalist organizations were fused into the Ceylon National Congress. This body, unlike its Indian prototype, used only constitutional means to attain its ends In 1921 the Legislative Council was given an unofficial majority, though the number of officials was greater than the number of elected members and the franchise was very restricted. In 1924, however, the elected members were given a majority in the Legislative Council, while the Executive Council still contained an official majority The island thus had representative government with an irresponsible executive

Nationalist opinion was still not satisfied, and in 1927 a Commission with Lord Donoughmore as chairman was appointed to examine the working of the Constitution and to report what amendments should be made [1] The Commission found, like Lord Durham in 1840, that the most striking characteristic of the Constitution was 'the divorce of power from responsibility'. The elected members were placed on the horns of a dilemma The Constitution could not be worked harmoniously save by co-operation between officials and elected members; if they co-operated, however, the elected members might be regarded as having abandoned their claim to self-government. In practice the unofficial members regarded themselves as the permanent Opposition—an Opposition, too, which had a majority.

> 'Denied all prospects of office, the unofficial members were in no danger of being called upon to translate their criticisms into action and to execute in practice the measures which they advocated They were free therefore from the deterrent which is usually present to the Opposition in countries where parliamentary government obtains Apart from their responsibility to their constituencies, in which the bulk of the people were debarred from the franchise,

[1] Cmd. 3131 (1928).

> they were free agents who, while able by their slightest actions to affect the fortunes of their country, possessed, if called to account for those actions, a convenient scapegoat ready to hand It is thus no matter for surprise that the launching of continuous and irresponsible attacks on the members of the Government collectively and individually became the distinctive feature of their policy.'[1]

The Government decided to adopt a conciliatory attitude in the hope of achieving co-operation, but their success induced the elected members to redouble their attacks. The Governor could intervene only in matters of 'paramount importance' and had to acquiesce in the devitalization of his Executive Council Though technically President of the Legislative Council, it had been ruled that he should so act only on formal occasions. His position resembled that of a Prime Minister whose duty it was to carry on the Government with a minority in the House but who was denied entrance to the House and had to work through a Deputy.

The Ceylon National Congress had asked for full responsible government immediately; but the Commission did not recommend that solution because (*a*) the Ceylonese politicians had had no experience of government, (*b*) there was need for a greater measure of unity and corporate spirit

> 'If the claims for full responsible government be subjected to examination . . . it will be found that its advocates are always to be numbered among those who form the larger communities[2] and who, if freed from external control, would be able to impose their will on all who dissented from them. Those on the other hand who form the minority communities, though united in no other respect, are solid in their opposition to the proposal A condition precedent to the grant of full responsible government must be the growth of a public opinion which will make that grant acceptable, not only to one section, but to all sections of

[1] *Ibid*, p 21
[2] i e the Sinhalese.

the people, such a development will only be possible if under a new constitution the members of the larger communities so conduct themselves in the reformed Council as to impose universal confidence in their desire to act justly, even at a sacrifice to themselves.'[1]

The scheme recommended by the Commission was a sort of dyarchy. There was to be a State Council elected on adult male franchise, women over thirty being also enfranchised The Legislative Council, when it debated the matter, asked that all women of twenty-one and over be enfranchised and this modification was approved. The State Council was to divide itself into seven executive committees, each of which would elect a chairman, who would be appointed by the Governor as Minister. The executive committee would be charged with the general direction and control of a group of Departments The Departments dealing with the public service, law and finance, however, were placed under senior officials, the Officers of State, who were responsible to the Governor and who were also to be members of the State Council without votes The three Officers of State and the seven Ministers were to be members of the Board of Ministers and, as such, collectively responsible to the State Council for finance but not for other matters, which might go direct to the State Council from the Officers of State or the executive committees.

The new Constitution was accepted by the Legislative Council by the narrow majority of two votes and came into operation in 1931 It was a complicated and difficult Constitution; and when, at a later stage, the Ministers asked for full self-government their most telling argument was that they had successfully worked the Donoughmore Constitution One of its defects was that, far from encouraging the formation of parties, it actually discouraged them because it gave the independent member a substantial power as a member of an executive committee and so split up the functions of government that a party policy was impracticable On the other

[1] Cmd 3131, p 31.

hand, it gave members of the State Council some familiarity with the problems of government and, in spite of its defects, enabled the State Council to bring about many valuable reforms

No party organization was developed to fight the State Council elections and the only possible classification of members was the communal, though in fact divisions were rarely on communal lines. Of the fifty-eight elected and nominated members, thirty-eight in the first Council and thirty-nine in the second were Sinhalese. In the former two minority members were elected Ministers; but in 1936 all the Ministers were Sinhalese, this having been arranged mainly to secure a 'united front' for further reforms. Immediately after its creation the State Council began to press for more self-government and this pressure continued until 1943. The lead was invariably taken by the Sinhalese and it became clear that the fundamental issue was that of representation The Donoughmore Commission had rejected communal representation and the Sinhalese insisted on territorial election—which would, of course, give them a large majority The minorities, on the other hand, demanded communal representation The Sinhalese might have been willing to compromise by weighting territorial representation, but the Tamils demanded 'fifty-fifty' or equal representation of majority and minorities by means of communal seats

In 1941 His Majesty's Government announced that the constitutional problem would be discussed by a commission or conference after the war The Ministers rejected this as inadequate and continued to press for a decision In 1942, on the occasion of the Cripps Mission to India, the State Council demanded Dominion status In May, 1943, the British Government announced that the post-war examination of the problem would be directed towards the conferment of full self-government in matters of internal civil administration and authorized the Ministers to draft proposals subject to certain conditions. The Ministers gave their own interpretation of those conditions and proceeded to draft a Constitution

Towards the end of 1944 a Commission under Lord

Soulbury was appointed to consider the Ministers' Draft and any other proposals that might be made The Commission approved the draft subject to minor amendments and to the addition of a Senate. There were discussions between the Secretary of State for the Colonies and Mr D S. Senanayake, Leader of the State Council, in July, 1945 Mr. Senanayake asked for full Dominion status, but the White Paper issued in October, 1945, while containing a contingent promise of Dominion status, provided for the time being minor modifications of the Ministers' Draft as amended by the Soulbury Report. The White Paper was accepted by the State Council by fifty-one votes to three, two Indians and a Sinhalese voting against In February, 1947, while steps were being taken to bring the new Constitution into operation, Mr. Senanayake again raised the question of Dominion status, and in July, 1947, it was announced that as soon as the new Constitution was in operation, and agreements for the transfer of power had been reached, Dominion status would be conferred

The Constitution which came into operation on the 4th February, 1948, was of the 'Dominion' type The Queen was to be represented by a Governor-General and there were to be two Houses of Parliament. The Senate was to contain 30 members, of whom 15 were to be elected by the House of Representatives by single transferable vote, and 15 were to be appointed by the Governor-General One-third of the Senators were to retire in every second year. The House of Representatives was to consist initially of 95 elected members and not more than 6 members appointed by the Governor-General to represent minorities not adequately represented among the elected members. The number of elected members was to be changed after every census, but this was not done after the census of 1953 and accordingly the number was increased to 151 by a constitutional amendment in 1958. The basis of distribution was to be one seat for 75,000 population and one seat for every thousand square miles of territory This was a device for securing adequate representation for the Tamils and the Muslims It happened that these communities

were strongest in the sparsely populated provinces. If those provinces were given higher representation than would be justified by population alone, minority representation would be increased. Since there were also to be six nominated members to represent minorities, there would always be a substantial measure of minority representation, without affecting the major principle of 'one man, one vote'.

Other provisions for the protection of minorities were inserted. Independent Public Service and Judicial Service Commissions were set up for the appointment, dismissal and disciplinary control of civil and judicial officers A general prohibition against discriminatory legislation was imposed Even so, it became plain in 1956 that the framers of the Constitution had underestimated the strength of communal sentiment The United National Party was founded by the leading politicians in 1947 and it won the general elections of 1948 and 1952. The Party had been led, up to 1952, by Mr. D S. Senanayake, whose enormous popularity and firm antagonism to communalism had made an obvious success of the Constitution Before his death he had virtually dismissed one of the Ministers, Mr S W R D Bandaranaike (formally, he resigned), who proceeded to form his own party, the Sri Lanka Freedom Party, on frankly communal policies. Though in a small minority in the Parliament of 1952–6, the party was able to make effective propaganda among the Sinhalese villagers. In effect, the party led a revolt by the Sinhalese-educated and the illiterate against the English-educated and the Tamils With the assistance of those communist groups which were willing to help any kind of social disruption, the S.L F.P. obtained a majority at the general election of 1956 and Mr. Bandaranaike became Prime Minister. There was a progressive deterioration in communal relations, labour relations and political morality, ending in widespread disorder in 1958 Fortunately, Ceylon had a very unusual Governor-General, Sir Oliver Goonetilleke, who, with the consent of the Prime Minister (and therefore technically on 'advice'), took charge of the emergency measures and restored order. This

escape from anarchy did not destroy the reputation of the Prime Minister because he was assassinated twelve months later, and his party, led by his widow, won the general election of 1960

Malaya and Singapore

The Malay Peninsula, like the British Isles and Ceylon, has been the termination of waves of migration. There are still among its inhabitants primitive aborigines, some of whose ancestors seem to have migrated there before the beginning of recorded history The Malays, who regard themselves as the indigenous inhabitants, migrated from Yunnan in southern China between 2500 and 1500 B C. They are by no means all of the same stock, and all the stocks have been modified by migrations and invasions from Sumatra, Java and the Celebes and by intermarriage with Chinese, Indians, Siamese and Arabs. Long before Malaya was known to the western peoples it was known to the Chinese, and there are still relics of ancient Chinese colonies, though most of the Chinese in Malaya came in under British rule. The Indians, too, knew Malaya. Indian traders first came in, it seems, in the first century of the Christian era They intermarried with the local people and formed city states which eventually became part of the Indo-Malay kingdom of Sri Vijaya, whose capital was in Kedah. Indian cultural and economic dominance lasted until the fifteenth century, when the Malay kingdom of Malacca was founded. That kingdom was destroyed in 1511, when the Portuguese captured Malacca. Though the Sultan moved to Riau, then in Johore, and claimed suzerainty over a wide area, the kingdom was weak and eventually broke into several States The Sumatrans (from the kingdom of Acheh), the Siamese and the Bugis (from the Celebes) were successive invaders. Johore, Pahang and Trengganu were, theoretically, provinces of the kingdom of Riau, but Trengganu as well as Kelantan and Kedah (which then included Perlis) were tributaries of the King of Siam. Perak was established by the son of the last King of Malacca. Selangor was founded by the Bugis and Negri Sembilan by the Miningkabaus from Sumatra.

All these have become 'Malays' as well as many people of mixed descent and generations of migrants from Java and Sumatra. What is more, they all became Muslim. Islam spread from Sumatra to the kingdom of Malacca. The Portuguese occupation of Malacca and their war on all 'Moors' helped to spread Islam into the interior. Even more important, probably, were the invasions from the Sumatran kingdom of Acheh, for the Sultans of Acheh forced conversion at the point of the sword. By the end of the seventeenth century all the Malays had become Muslims, though they have never accepted the rigid orthodoxy of Arabia.

The Portuguese never had control of Malaya outside Malacca, and in 1641 they were ousted by the Dutch East India Company. What the Dutch wanted was not territory but trade. Their monopoly was never complete, for it was easy for Indian and Arab traders to trade through Siam and Kedah. In any case, the monopoly was broken in 1786, when the British East India Company acquired Penang, and in 1800 they purchased Province Wellesley, on the coast opposite the island, from the Sultan of Kedah. Dutch rule, even in Malacca, was coming to an end. In accordance with the policy followed at the Cape and in Ceylon, the British occupied Malacca in 1795 in the name of the Stadtholder. It was restored to the Dutch in 1814 but was ceded to the British in 1824, when the Dutch gave up all rights in Malaya and the British all rights in Java. The same treaty confirmed all British rights in Singapore. Sir Stamford Raffles had established a 'factory' on that almost uninhabited mangrove swamp in 1819, by purchase from the Sultan of Johore, but the East India Company's title was contested by the Dutch.

In 1824, therefore, the East India Company held the three 'Straits Settlements' of Penang, Malacca and Singapore. Penang and Singapore were 'free ports' into which the trade of the Indies poured, and already in 1825 they had far outstripped Malacca. British rule led not only to British trade but also to large-scale Chinese, Indian and even Malay immigration. This was not due to efficient administration, for the Straits

Settlements suffered the worst effects of Company rule The Settlements were transferred to the Crown and managed by the India Office from 1858 to 1867 and by the Colonial Office after 1867. Gradually one of the most efficient—possibly the most efficient—colonial administrations was built up Malacca has become 'sleepy hollow', but Penang and Singapore are great Chinese cities, worthy memorials not only to the skill and enterprise of the Chinese people, but also to that great body of British administrators, the Malayan Civil Service.

It was Malayan because, notwithstanding the British reluctance to assume new responsibilities, protection had in fact been extended to the Malay States Except in the north, where the Siamese were in control of Kedah from 1821 to 1842 (when Perlis was split off) and claimed suzerainty over Kelantan and Trengganu, the treaty of 1824 had the curious effect of making the Malay States independent The rulers of Johore and Pahang were theoretically viceroys of the Sultan of Riau, but under the treaty Riau came within the Dutch sphere of influence, and the viceroys found it easy to declare their independence. Similarly, the Bugi kingdom of Selangor was isolated from the Celebes and Negri Sembilan from Sumatra. Very soon all the southern States except Johore were bordering on a state of anarchy The disputes among the Malays were not lessened by the hordes of greedy concessionaries, mostly Chinese, who swarmed into the States from Penang and Singapore, looking for easy money The Sultans did not think it was their business to protect the Chinese from the Malays, and they could neither protect the Malays from the Chinese nor the Chinese from each other Protests from the Chinese merchants in the Straits led the British Government to change its mind in 1873 Her Majesty's Government, though having no desire to interfere in the internal affairs of the Malay States, found it incumbent 'to employ such influence as they possess with the native princes to rescue, if possible, these fertile and productive countries from the ruin which must befall them if the present disorder continues unchecked'.

The first experiment in intervention, in Perak, was most unsuccessful, chiefly owing to the inexperience and obtuseness of the first Resident. More cautious methods were adopted by more diplomatic officials in Selangor, Negri Sembilan and Pahang. In 1909 the Siamese Government ceded to the British Government its suzerainty over Kedah, Perlis, Kelantan and Trengganu. The last State to receive protection was Johore. Its relations with Singapore had long been friendly and close, but the spread of the rubber estates made more efficient administration essential, and agreement was reached with the Sultan for the installation of an Adviser in 1914, though the Sultan kept his private army

The essential task of a Resident or Adviser was to 'advise' the Sultan. Since the Sultan had already agreed to accept the advice, it was something of a formality, but it was a diplomatic formality, and orders were always issued in the name of the Sultan, not of the Resident. The system worked easily because Malay Rulers had been accustomed to work through powerful deputies, and what was unusual was that the Residents lived on their pay and not on what they could make on the side, and did not take part in conspiracies to put themselves on the Sultan's throne. British protection in fact guaranteed the Rulers' thrones, maintained their dignities and privileges, provided them for the first time in their history with assured incomes, and preserved their control over the Islamic religion and Malay custom. They presided over State Councils in which, for the first time, Europeans and Chinese, as well as Malays, had representation, and of which the Residents or Advisers were members As the State revenues increased through efficient administration and the production of rubber and tin, it became possible to provide the services of a modern State, excellently administered by the Malayan Civil Service Perak, Selangor, Negri Sembilan and Pahang were combined in 1895 in the Federated Malay States. Whether this was a mistake or not Whitehall was never able to decide On the one hand it became clear that the other five States wanted no federation. On the other hand the F M S became, because of

their natural resources, one of the show-pieces of British colonial administration.

From the Japanese occupation of 1942–5 only the Malayan Chinese came with their reputation unimpaired They treated the Japanese troops with the amused contempt which they inherited from their ancestors. British prestige suffered less from the ignominious defeat than from the ham-fisted Military Administration which followed the liberation It is probable, too, that the Colonial Office was never so ill-advised as when it developed in 1943 its scheme for a Malayan Union On paper it was quite a sensible scheme It sought to separate Singapore from the rest of Malaya because it was virtually a Chinese city: and this part of the Malayan Union proposal has been continued. Next, it sought to unify the five million people on the mainland and in Penang. Of this five million almost exactly a half were Malays, and in Perak, Selangor, Negri Sembilan and Johore, as well as in Penang, they were in a minority; and yet in all the States only Malays were subjects of the Rulers. To have nine States for a mixed population of five million Malays, Chinese and Indians was obviously absurd Accordingly, it was proposed to have a single protectorate, with a single Malayan citizenship, including Penang and Malacca. The Rulers were induced to sign treaties accepting the scheme, though they were not given time to consult each other or their subjects. Nor were the methods of persuasion adopted by the Colonial Office acceptable either to Malay opinion or to those British officials who knew Malaya well

The Federation of Malaya

A storm of protest, both in Malaya and in the United Kingdom, compelled the Colonial Office to withdraw the scheme Singapore was retained as a separate colony, but new agreements were signed converting the nine States and the settlements of Penang and Malacca into the Federation of Malaya, which came into existence in 1948 The experience led, however, to the development of nationalist ideas, in most cases strongly tinged with communalism, among the Malays, the

Chinese and the Indians Among the younger men, nationalism was stronger than communalism: and when Tunku Abdul Rahman Putra, a scion of the Royal House of Kedah, became leader of the United Malay Nationalist Organization, he was able to reach agreement with the Malayan Chinese Association and the Malayan Indian Congress on a programme leading to the emergence of the Federation of Malaya, in 1957, as an independent member of the Commonwealth.

There was another reason for this development As has already been mentioned in another connection, the independence of India, Pakistan, Burma and Ceylon in 1947–8 had led the Asian communist parties to hold a meeting to settle their future strategy This meeting, it is believed, led to the communist revolt in Burma, the Korean War, the revolt in Indo-China and an intensification of communist subversion in Indonesia It also led to the conversion of the war against 'imperialism' into a war against 'colonialism'. In Malaya five thousand communists, mostly Chinese, took to guerilla warfare in the jungles. In Singapore the methods were arson, assassination, sabotage and strikes This technique of associating communist with nationalist movements was not new, and it did not deceive either the nationalist Malays or the English-speaking Chinese. What is more, the guerilla warfare did not end with the self-government of the Federation. The communist leader, Chen Ping, was willing to bring it to an end only if the Malayan Communist Party was legalized and all proceedings against communists were stopped In other words, the party wanted to be put in a position openly to subvert independent Malaya Even so, it was desirable, as part of the war against the communists, to remove the argument that the communists were fighting 'colonialism'. From the moment when the first Alliance Government took office under Tunku Abdul Rahman, five years were needed to bring the guerilla warfare to an end in 1960.

The communists also made easy the solution of the one problem that might have held up independence. It is difficult to persuade nationalist politicians in a dependent country

that, when the country becomes independent, it may need to be defended by armed force War, they commonly argue, is due to a competition between 'power blocs'. They have only to adopt a 'neutralist' policy to avoid being involved in this competition for power. With the communists in power in China, a large Chinese population in Malaya and Singapore, communist aggression in Indo-China, communist subversion in Indonesia and communists in armed rebellion in the Malayan jungles, there was no doubt that the Federation needed defence, nor that, at least for some time, it could not adequately be provided from Malayan resources The Malayan leaders therefore had recourse to a device which the Ceylonese Ministers had first suggested—though in Ceylon the United Kingdom Government never realized, until too late, the significance of the suggestion—a defence agreement between the United Kingdom and the Federation of Malaya, whereby bases would be provided for British troops and joint arrangements made for the defence and internal security of the Federation

Once it was clear that Tunku Abdul Rahman could form a stable government, having the support of Malays, Chinese and Indians, that a Constitution could be devised which on the one hand would be democratic and on the other hand would maintain the prestige of the Malay Rulers, and that the defence of Malaya against external aggression and internal subversion would be adequately provided for, there was no justification for delay and indeed every justification for speed. At the general election of 1955 the Tunku had said that he would obtain independence in two years Though the job was more difficult than he appreciated, the British Government took this as a challenge and gave him enthusiastic support This is one of the few election promises carried out fully and without fail

The Federation of Malaya contains eleven States, of which nine have Malay Rulers and two (the former Settlements of Penang and Malacca) have Governors It is, strictly speaking, neither a monarchy nor a republic. Its Supreme Head, or Yang di-Pertuan Agong, is given the title of 'Majesty', but he is

one of the Malay Rulers elected by the Rulers for a period of five years While he holds that office, his State is left in the hands of a Regent. Responsible government of the British type is operated both in the Federation and in the States. The Federal Parliament is bicameral The Senate (Dewan Negafa) consists of 38 members, of whom two are elected from each State and 16 are nominated by the Yang di-Pertuan Agong. The House of Representatives (Dewan Ra'ayat) contains 104 members elected for single-member constituencies in the States on the basis of adult suffrage

The population of the Federation in 1957 was 6,279,000, of whom 3,127,000 were Malaysians (Malays, Sumatrans, etc.) and 2,333,000 were Chinese The country has a sound economy because it is the major producer of rubber and the producer of 40 per cent of the world's tin. Rubber accounts for 70 per cent of its exports, and tin for 14 per cent; but palm oil, coconut oil, pineapples, timber and iron ore are also important exports. Most of the large rubber estates and the larger tin mines are in the hands of European companies, which use Chinese or Indian labour. Most of the smaller estates, smallholdings and smaller tin mines are in the hands of Chinese The Malays prefer to be rice-producing peasants. This indeed is the main problem of the Federation, that the Malays claim a 'special position' as the earlier immigrants, while the Europeans, the Chinese and the Indians produce most of the wealth. What is more, the urban proletariat is mostly Chinese, many of whom are recent immigrants who know no English and little Malay.

Singapore

Singapore, with its adjacent islets, is about the size of Middlesex, though it has about a million fewer inhabitants As a former Secretary of State for the Colonies said, when the question of the independence of Singapore was first raised, 'You can sit on the roof of Government House and see the whole —— country ' It was, however, pointed out to him that there were six States members of the United Nations with a

smaller population and sixteen with a smaller revenue. Its development since Raffles landed in 1819 has been most remarkable, and it has been due entirely to British rule and Chinese, Indian and British commercial enterprise, for the ancient Singapura (Lion City) had been destroyed by the Javanese in or before 1377.

Singapore is physically separated from the Federation of Malaya only by a causeway Its political separation was considered necessary because its considerable Chinese population—730,000 out of 940,000 in 1947 and 1,140,000 out of 1,510,000 in 1958—would result in a Chinese majority if it were included within the Federation. In the Federation as it now exists, the four richest States—Penang, Perak, Selangor and Johore—have Chinese majorities. If Singapore were added it would be the richest and the most populous of them all and it would be impossible to regard the Federation as primarily a Malay country. In this respect the Malays agree with the British administrators who first made the political separation. Though from time to time Lee Kuan Yew, Prime Minister of Singapore, speaks of the manifest destiny of Singapore as a part of the Federation, the Tunku consistently refuses to grasp so prickly a thistle

The creation of a small colony the size of Middlesex nevertheless raised the question of political development. It was impossible to allege that the large, cosmopolitan and wealthy population of Singapore could not produce the politicians and administrators suitable for a flourishing city-state, nor that it lacked the financial resources to maintain an administration Its large and rapidly growing population certainly presented a problem if it was isolated from the Federation, because Singapore has no resources capable of development and migration elsewhere (except back to China) is impracticable What is more, it would be a serious matter for Singapore if its entrepôt trade were diverted to Penang and Port Swettenham in the Federation The semi-anarchy into which Indonesia has fallen since the termination of Dutch rule has increased the problem, since a large part of the

Indonesian trade had passed through Singapore. Above all, here was a rich city full of turbulent and unassimilated Chinese immigrants How were defence and internal security to be maintained? Singapore might be able to maintain four battalions of troops; it could not expect to maintain a navy (and in fact it wanted to hand over to the Federation the Royal Malayan Naval Reserve) or an air force If, however, the Royal Navy and the Royal Air Force were to assist in the defence of Malaya and Singapore they would need bases on Singapore Island. It followed that, unless and until the Federation of Malaya was willing to absorb Singapore, the United Kingdom would have to retain responsibility for the defence and external relations of the island.

The main difficulty was the maintenance of internal security, on which Singapore's prosperity rests, and which is complicated by gangs, secret societies, clan warfare and both communist and Kuomintang politics. In particular, communist activity had on several occasions led to serious organized rioting which had required the use of British troops. The British Government at first thought that these dangers would require British control over internal security The Singapore Government of David Marshall (the son of an immigrant from Iraq), which was established in 1955 on a semi-self-governing basis, contested this assumption, and negotiations in 1956 broke down. Subsequently, however, Lim Yew Hock reached an agreement for an Internal Security Council, on which the United Kingdom Government and the Government of Singapore would be equally represented, with a chairman appointed by the Government of the Federation of Malaya. On this basis the State of Singapore was established with full internal self-government in 1959 The general election of that year was won by the People's Action Party, led by Lee Kuan Yew, with communist support The Government is in the hands of able young men, mostly graduates, who have so far managed to steer a cautious passage which has led neither to a breakdown of Singapore's commercial strength nor to communist disruption.

6

THE AFRICAN PEOPLES

CAPE TOWN was taken from the Dutch and retained after the French wars because it was on the route to India. Suez Canal shares were bought in 1878 and Egypt occupied in 1882 because the Canal was part of the route to India. As we have seen, force of circumstances rather than territorial ambitions led to the creation of the Union of South Africa. Britain in the middle of the nineteenth century could have annexed the greater part of Africa had her Governments been so minded. For the greater part of that century, however, the principle objective of British policy was to avoid new commitments. The main objective in Africa, from 1807 to 1886, was to put down the slave trade in West Africa, and this led to the foundation of Sierra Leone, the Gambia, Ghana and Nigeria. There was a change of policy after 1886, due to three main factors The first was the renewed incursion of the French and the new incursion of the Germans It was not mere competition for colonies, for their purpose was to establish protectionist zones for the development of their own industries behind tariff walls. British industry was already feeling the effects of European competition, and there were apprehensions that the African territories would be lost both as sources of raw material and as potential markets for British industry if they were not brought within the system of free trade which operated under the British flag. Secondly, the discovery of gold in the Transvaal had drawn attention to the potential mineral resources of Central Africa. Cecil Rhodes and his associates in the Cape Colony were particularly anxious to extend their activities into what is now called Rhodesia, and to provide an all-British route from the Cape to Cairo Thirdly,

in the 'seventies and 'eighties there was an extension of missionary activity in Africa, and the missionaries were as anxious for the extension of British jurisdiction as the traders, in order to stamp out the slave trade and other social evils. The 'abolitionist lobby' in the House of Commons became the 'missionary lobby'. In any case, imperialist ideas were developing in the Victorian middle class, which dominated the Conservative Party after 1886.

The Union of South Africa is dealt with in Chapter 3 because, though it had an African (or Bantu) majority, it was governed by its European minority. Like South Africa, Egypt and the Sudan have become independent countries outside the Commonwealth. British Somaliland has joined with the independent republic of Somalia, outside the Commonwealth. Within the Commonwealth are Ghana, Nigeria, Sierra Leone, and the territories in East and Central Africa which are on their way to self-government.

British West Africa

English merchants of the seventeenth century knew only the coast of West Africa, and they knew it by a variety of names. Furthest west, the two great rivers, the Senegal and the Gambia, supplied names, then came, in succession, the Guinea Coast, the Grain Coast (now Sierra Leone and Liberia), the Ivory Coast, the Gold Coast (now Ghana) and the Slave Coast (now Dahomey and Western Nigeria). The first Europeans on the Coast were the Portuguese, who claimed a monopoly of trade under the papal bulls which, as we have seen, gave Central and most of South America to the Spaniards, and Brazil and territories to the east to the Portuguese These claims were not recognized by the Governments of north-west Europe and could not in fact be enforced. On the other hand, those Governments were not in favour of free trade They all chartered companies to establish monopolies, though the companies competed against each other. Even so, the monopolies themselves could not be enforced, and the 'interlopers' were so numerous that there was free trade on

the Coast long before Parliament accepted the principle in 1713. The decision of Parliament was nevertheless important, because it implied that some assistance should be given by Parliament for the maintenance by the chartered corporations of their 'forts' Not until the nineteenth century was provision made for administration by the Crown, and then British occupation was an incident in the battle against the slave trade.

The main object of the early traders was gold, whose existence in the rivers (the mines were not discovered until 1878) gave its name to the Gold Coast There was also, in the eighteenth century, a trade in spices, ivory, gum, precious stones and other local products Nevertheless, the principal trade, until it was forbidden by legislation, was in slaves. There is no evidence that Englishmen or other Europeans engaged in slave raiding. The interior was, in fact, unknown to the Europeans. The slave raiding was done by African chiefs, who sold the slaves to the traders on the Coast. The traders transported the slaves across the Atlantic and sold them to planters in the British, French, Dutch or Spanish colonies in the West Indies and on the American continent There were always individual Englishmen ready to protest against this odious traffic but what led to the agitation of the 'abolitionists' was the presence of slaves in England. They had been brought to England by retired planters, and a traffic in slaves developed even in England. In 1765 Granville Sharp met in London a slave who had been cast adrift by his master because he was no longer fit for work. Sharp began a campaign against slavery and secured a decision in 1772 in Somersett's Case that slavery was contrary to the common law of England Six years later the Scottish judges decided that it was contrary to the law of Scotland also, and so slavery became illegal throughout the United Kingdom after 1800, since the laws of England applied also to Ireland. To attack slavery outside the United Kingdom was a more difficult matter, for what was at first called the 'American interest' was strong in the House of Commons and no Government would want to lose its support.

The American interest was weakened by the rebellion of thirteen of the American colonies, which resulted in slavery becoming an institution in some of the United States. Accordingly, the slave trade was not forbidden to British subjects until 1807 It had already been abolished for Danish citizens in 1802.

Meanwhile, the abolitionists had created the first British colony in Africa, Sierra Leone. The judgment in Somersett's Case set free 14,000 slaves. Many of them became destitute, and in 1780 a committee of abolitionists secured Government support for transporting some of them to Sierra Leone. The first settlement failed, but a second attempt, made in 1790, was more successful. It was under the control of a chartered company until 1808, when it became a Crown Colony

In 1807, when the slave trade was forbidden to British subjects, Britain had one small colony in West Africa, Sierra Leone There were primitive 'forts' in the Gambia and on the Gold Coast, but the footing in the Gambia was precarious because of strong French influence in Senegal; and there were French, Dutch and Danish forts, as well as British, on the Gold Coast. The British forts were leased from the local chiefs by a chartered corporation, originally the Royal African Company, and, after 1750, the African Company of Merchants. After 1807 the Royal Navy was given the job of suppressing the slave trade, in whatever ships the slaves might be carried, and from 1809 there was 'for the first time, a force of law to which to appeal where previously no retribution even for the most appalling wickedness could be hoped for The coming of the white ensign of the preventive sloops was in fact the first herald of civilization in darkest Africa'[1]—except, of course, in the significantly named Freetown. On the other hand, the Royal Navy had an impossible task in the days of the windjammer, and after Waterloo more slaves were exported than ever before. In effect, Parliament had to choose between extending British rule and giving up the attempt to try to suppress the slave trade in areas which it could not police.

[1] *Cambridge History of the British Empire*, ii, p. 644.

The British politicians did not want to do either, and as usual they compromised by doing both. In 1821 all the settlements on the Gambia and the Gold Coast were joined with Sierra Leone in a single 'Colony of the West African Settlements', but forthwith it got into trouble with the Ashanti. The Governor, Sir Charles Macarthy, tried to repel an Ashanti invasion with an inadequate force and was killed In 1826, however, the Ashanti were defeated and in 1831 a treaty of peace was signed It was at first decided to abandon the settlements, but later it was decided to hand them over to a committee of merchants, who were given a small parliamentary subsidy. Meanwhile the slave trade had increased so much that in 1825 it was more flourishing than in 1807. The trading was now done in the interior, and it could be prevented only by extending British jurisdiction there. Also, it was impracticable to maintain the settlements unless arrangements were made with the neighbouring chiefs for the mutual surrender of fugitives Though the British Government had made it plain that British jurisdiction was not to be extended, the first President of the Gold Coast Council (which had taken over the settlements), George Maclean, entered into what were virtually treaties of protection with the chiefs of the coastal belt In effect, he extended the jurisdiction of his Council over almost the whole of what afterwards became the Gold Coast Colony

In 1836 Sir James Stephen, son of the James Stephen who had been so prominent among the abolitionists, was appointed Permanent Under-Secretary at the Colonial Office By profession a lawyer, he sought to put some order into the chaos of West Africa, though like everybody else he did not want more colonies The Reform Act of 1832 had weakened what was now called the West India interest, but it was still powerful and was looking for labour to replace the emancipated slaves. The abolitionists feared that there would be some system of indentured labour, which would be something like slavery in disguise. They were also anxious to protect the missionaries outside the settlements. What is more, their arguments were

supported by the traders, who were anxious to meet the demand for oil in Great Britain by purchasing palm-nuts from the Coast. These pressures induced the Colonial Office to reverse its policy in 1840 and to follow Maclean's example in making treaties. These treaties were not intended to extend British jurisdiction, but in effect the Governor of Sierra Leone assumed some responsibility for a wide area outside the colony. Also, in 1843 the Gold Coast settlements were once more taken over by the Crown and Maclean's treaties were ratified. Foreign Jurisdiction Acts were passed to enable the Crown to exercise jurisdiction outside British territory—they led to the consolidating Foreign Jurisdiction Act of 1890 under which so much of Africa (and some parts of Asia) was ruled during the twentieth century. One of Maclean's last acts was the negotiation of the 'Bond', a series of treaties with the Gold Coast chiefs, entered into in 1844, whereby British criminal jurisdiction was extended over a wide area. In 1850 the Danish settlements on the Gold Coast were purchased, together with the Danish protectorate over the banks of the River Volta. When the Dutch released their forts on the Gold Coast in 1871–2, as part of a 'package deal' with the United Kingdom, the whole Coast came under British control. An attack on the British protectorate by the Ashanti in 1872 led to their defeat, but relations with the Ashanti were uneasy until a bloodless expedition in 1895 brought the Asantehene under control.

Meanwhile, British jurisdiction had been extended along the coast. There had been British settlements in Whydah (now Ouida in Dahomey) and Fernando Po, but they had been abandoned. The railway boom in Britain increased the demand for oil, and the best oil was obtained from that part of Nigeria which was called the Oil Rivers. The French had followed the British by abolishing the slave trade, for French citizens, in 1830, and French merchants were as anxious as the British to obtain Niger oil. What is more, French merchants began to recruit indentured labour from the King of Lagos. In 1861 a British naval force demanded the surrender of the

town and the port and their hinterland. The Colony of Lagos was formally annexed in 1863.

Even so, a parliamentary committee in 1865 considered the question of a withdrawal from West Africa. It decided that the step was impracticable because of the numerous agreements made with the chiefs since 1840. What it did recommend was a unification of the settlements, which was approved by the British Government, though the decision was reversed in 1874. French and German activity in West Africa after the Franco-Prussian War of 1870 was, however, met by a stronger reaction in Great Britain. In relation to West Africa Lord Salisbury's Governments were disposed to be liberal towards French claims, in the hope of agreement on the more difficult problems of Egypt and the Upper Nile. The spheres of British influence in the Gambia, Sierra Leone and the Gold Coast were settled by an Anglo-French delimitation commission in 1889. Nigeria was a more difficult problem because the French were concerned on the west and north and the Germans on the east; but by 1900 these problems had been settled. Except for the accession of part of Togoland to Ghana, and of the northern part of the Cameroons to Nigeria, and some frontier adjustments, the boundaries of the Gambia, Sierra Leone, the Gold Coast (Ghana) and Nigeria were in 1900 what they are now. This did not mean that British rule extended throughout those areas. On the contrary, the practice of supporting the chiefs so long as they maintained law and order, and in particular prohibited the slave trade, was erected by Lord Lugard into the policy of 'indirect rule'. In other words, the chiefs became instruments of a light but obvious British rule, and where the chief proved obdurate, as in the case of King Prempeh of Ashanti, Joseph Chamberlain as Colonial Secretary did not hesitate to use the big stick. In the early years of the present century, therefore, the four West African territories showed a common form. Each of them consisted of a small colony on the coast, incorporated in the dominions of the Crown, and governed directly on behalf of the Crown, and of a large protectorate in the hinterland

regulated under the Foreign Jurisdiction Act, but generally ruled lightly and indirectly through the chiefs.

Ghana

Ghana was the name chosen by the Gold Coast Legislative Assembly, in anticipation of independence, in 1956. The name derives from the ancient African empire from which, according to some historians, the peoples of the Gold Coast derived. The country is, however, wholly the product of British rule, and its boundaries were, in the main, settled by an Anglo-French convention. Its territory consists of the territory of the Gold Coast Colony, the Gold Coast Protectorate, and British Togoland, part of the German colony which Britain had administered as a mandated or trust territory since 1919

Ghana has been an independent country within the Commonwealth since the 6th March, 1957—the anniversary of the signature of the 'Bond' in 1844 In view of the tortuous history of the Gold Coast settlements and the difficulties of their relations with the kingdom of Ashanti, it may seem surprising that it should be the first of the British African colonies to achieve independence The explanation is, however, the same as in Ceylon. Economic developments and missionary enterprise had given the Gold Coast a substantial English-educated middle class which had become nationalist, and to which authority could be transferred after a comparatively short experience of representative government The wealth comes mainly from cocoa, the seeds of which were smuggled out of Fernando Po in 1879 Early in the present century the Gold Coast became the leading cocoa-producing area in the world What is more, most of the production has been in African hands, though the trading was done mainly by European companies. The missionary enterprise was substantial because of the numerous trading settlements established not merely by the British but also by the French, the Dutch, the Danes and the Swedes Since the beginning of the present century education has been given in English, which has to

remain the medium of instruction because there are over forty local languages. The reliance on missionary effort had, however, the defect that not enough was done for secondary and higher education. Until 1948 the only institution for higher education was the missionary college at Achimota. The University College at Legon, a suburb of Accra, is now the most impressive memorial of British rule, a substantial part of the capital cost having been met from United Kingdom funds. There is also a College of Technology at Kumasi, and there are hundreds of Ghanaian students in European and American universities Dr. Nkrumah, the President, was a student of an American university and of the London School of Economics Though it was necessary to retain some European officials, the English-educated class was large enough to provide a substantial Ghanaian element in the judicial and civil services.

In 1957 Ghana was, in terms of population, the smallest of the independent countries of the Commonwealth other than New Zealand. Its population was then estimated at 4,750,000, but it had a revenue of over £45 million and a total trade of £188 million. Though independence would necessarily involve increased expenditure, especially on defence and external affairs, it could not be denied that Ghana would be an economically viable country

A Legislative Council was established in the Gold Coast Colony in 1850, though it consisted only of two Government officials and two 'gentlemen', nominated by the Crown Representative government was not introduced until 1925. but an African majority was provided for the first time in 1946, when Ashanti as well as the Gold Coast Colony was represented The Constitution of 1951, which provided representation for the peoples of the Northern Territories and Trans-Volta also, was founded on the report of an African committee presided over by Sir Henly Coussey In 1952 the office of Prime Minister was created, and Dr. Nkrumah was appointed to it The Constitution of 1954 was fully self-governing, save that the Governor retained responsibility for external affairs, defence and internal security and also had

a special responsibility for certain matters relating to the police

The Convention People's Party, led by Dr. Nkrumah, won 79 out of 104 seats at the general election of 1954 Its ideas were founded on the nationalism of the detribalized Africans of the Coast In Ashanti and the Northern Territories tribalism was still strong To the European reader the word 'tribe' suggests a primitive form of social organization; but that is because, in Europe, the tribes were converted via feudalism into an absolute or constitutional monarchy. Where it still flourishes in Africa, it is essentially democratic, because a collective decision is taken at a tribal meeting. It vests prestige and influence in the chiefs and elders, not power, whereas the ballot-box democracy of Europe vests power as well as prestige in 'transient and embarrassed phantoms' called politicians. These two views of democracy were in conflict on the Gold Coast and, as so often, the Government of the United Kingdom sought a compromise. Sir Frederick Bourne produced a scheme of devolution within a unitary system of government which was accepted by the Gold Coast Government, and in May 1956 the United Kingdom Government decided that the Gold Coast should have independence within the Commonwealth if, after a general election, a resolution to that effect was passed by a substantial majority of the Legislative Council. In fact it was passed unanimously because, though the Convention People's Party had only 79 of the 104 seats, the Opposition, which derived most of its support from Ashanti and the Northern Territories, absented itself A compromise between the centralizing tendencies of the coastal belt and the regionalism of the tribal areas was arranged personally by the Secretary of State for the Colonies, though it never came fully into effect

The resolution for independence was put into operation by the enactment of the Ghana Independence Act, 1957, which was based on the Ceylon Independence Act, 1947. The new Constitution, the Ghana (Constitution) Order in Council,

1957, was similarly based on that of Ceylon, though it also included the compromise negotiated by the Secretary of State This compromise, set out in Part IX of the Constitution, provided for a Regional Assembly, a House of Chiefs and (except in Ashanti) a Head for each of the Regions in Ashanti the Asantehene was to be the Head of the Region. The elections for the Regional Assemblies, held in 1958, were, however, boycotted by the Opposition and therefore resulted in overwhelming Government majorities.

The control by the Convention People's Party of both the Ghanaian Parliament and the Regional Assemblies enabled the Government in 1960 to sweep away the carefully formulated Constitution of 1957 and to replace it by a republican Constitution vesting very wide powers in a President who was at once Head of the State and Head of the Government. The necessary authority was given by an Act of the Ghanaian Parliament in February, 1960 Its purpose was twofold. First, it authorized the Parliament to turn itself into a Constituent Assembly to consider the Draft Constitution laid before it by the Government Secondly, it authorized the submission of the Draft Constitution, when approved by the Constituent Assembly, to a plebiscite At the same plebiscite the President of the Republic of Ghana was to be elected. The Draft Constitution was in fact approved, and Dr Nkrumah was elected President.

The Constitution is an ingenious fusion of the presidential system and the system of responsible government. The President has all the powers of the President of the United States without the restrictions imposed on the latter by the Constitution. What is more, he is also chairman of a Cabinet consisting (apart from the chairman) of Ministers who are members of the Assembly but not responsible to it. The possibility of a conflict between executive and legislature is avoided, or almost avoided, by gearing parliamentary and presidential elections. The President is empowered to dissolve the Assembly, but if he does he must either resign or stand for re-election. Each candidate for election to the Assembly must

pledge himself to a particular presidential candidate, and a presidential candidate is elected if a majority of members pledged to support him is elected If there is no such majority, the Assembly chooses a President by secret ballot Nor is the President in any way 'responsible' He can refuse assent to a Bill or any part of it, and, unless legislation otherwise provides, he acts within his discretion. The legislature has no power to reduce estimates, and if taxation Bills are rejected they may be submitted to referendum by the President and will then take effect if approved The provisions for the protection of minorities, which were in the 1957 Constitution, have been removed, and there is no guarantee of fundamental rights except by a Presidential declaration of his adherence to a set of 'Fundamental Principles'

Nigeria

Nigeria is another country which is wholly the product of British rule It is about four times the size of the United Kingdom, and it has a population estimated at 35,000,000 In point of population it ranks fourth in the Commonwealth, after India, Pakistan and the United Kingdom. It is, however, divided by religious and tribal differences.

British rule expanded from the Colony of Lagos which, as explained above, was formally annexed in 1863 as a base for the suppression of the slave trade Treaties were made with the neighbouring chiefs in an area which became known as the Lagos Protectorate From the Colony and the Protectorate British influence was extended by treaty along the coast to the boundary of the German colony of Kameroun (the Cameroons) in an area which was first called the Oil River Coast Protectorate and then the Niger Coast Protectorate. The hinterland, in which at first British, French and German traders were in fierce competition, was afterwards controlled by a chartered company, the Royal Niger Company, and the area of its jurisdiction was determined by treaties made with the French and the Germans. In 1900, however, the charter was suppressed and the territories under the control of the Com-

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At the census of 1952–3 the Northern Region had a population of nearly 17 million, the Eastern Region a population of 8 million, and the Western Region a population of 6·4 million. Not the least of the difficulties of integration is that more than half the Nigerians live in the Northern Region, and indeed this was another argument for the Middle Belt Also, the Northern Region is mainly poor agricultural land, producing grain and groundnuts. The trade is carried on mainly by British companies and by traders from the south, with the result that there is only a very small Hausa middle class. In 1931 only 1 per cent of the children under fifteen in the Northern Region attended schools other than the Quran schools, and so most of the northerners of the older generation are illiterate. In the south, on the other hand, there are large towns which have for generations if not centuries been in touch with European traders and in which educational development proceeded apace under British rule or protection Thus, the Western and Eastern Regions have been able to produce the politicians, administrators, clerks and technicians required for self-government, while in the north reliance has had to be placed on the emirs and the comparatively few educated men at their courts In 1931 about one-third of the children in Lagos were at school, though in the rest of the Southern Provinces only 5 per cent were at school

There was a nominated Legislative Council in Lagos from 1862 to 1922; and from 1913 to 1922 there was an advisory council for the whole of Nigeria, though it was described by a Governor in 1924 as 'a debating society in which nobody would enter into a debate'.[1] Inevitably this arrangement was unsatisfactory to the educated Nigerians of the coast; but the adoption of 'indirect rule' through the chiefs outside Lagos inhibited the development of democratic institutions of the European kind. Indirect rule was almost inevitable in the north It was practicable among the Yoruba of the west because they were tribally organized in large units In the east it was artificial and unpopular because the ancient

[1] Joan Wheare, *The Nigerian Legislative Council*, pp 30–1.

tribal authorities had long since disappeared and the Ibo were organized in small units Whether traditional or artificial, however, the system implied that anything like ordinary Crown Colony government was impracticable and, indeed, against the vested interests of the emirs and other chiefs

Nevertheless, something like Crown Colony government was established in 1922. The Legislative Council had an official majority and only four of the unofficial members—three for Lagos and one for Calabar—were elected. Also, it had legislative power only over the Southern Provinces, though the Budget for the whole of Nigeria was brought before it and accordingly it could debate the policy adopted in the Northern Provinces A few changes were made between 1922 and 1946, but the essential character of the system of government remained unaltered during that period Indeed, there was no agitation for change in the Legislative Council and, before 1945, not much agitation for change outside. Though Dr Azikiwe, editor of the *West African Pilot*, and a few educated people on the coast demanded representative government, the reforms of 1946 came mainly from British officials, who realized that more representative institutions must be established.

The reforms of 1946 in effect created the three Regions, though they had existed as administrative units since 1939, when Chief Commissioners had been appointed for the Eastern and the Western Provinces Each Region was given a Regional Council consisting in the East and the West of a House of Assembly and in the North of a House of Chiefs and a House of Assembly. All had unofficial majorities, but they were mere advisory bodies They were also electoral colleges for the new Legislative Council, which was given an unofficial majority and had its legislative power extended to the whole of Nigeria

After 1946 development was rapid. In 1949 the Governor initiated an elaborate series of discussions which led to the enactment of a new Constitution in June, 1951. The Regional Legislatures were enlarged and the official element was

reduced. In the Western Region a House of Chiefs was added to the House of Assembly. In each Region a Regional Executive Council, containing both official and unofficial members, was established, though it was subject to general directions on policy from the Council of Ministers. The Regional Legislatures elected from among their own members the members of the Central Legislature, except for twelve members nominated by the Governor. At the centre, too, there was a Council of Ministers consisting of six officials and twelve Nigerians—four from each Region.

Under the 1946 Constitution a party system, on a Regional basis, which was also a communal basis, developed In the Western Region Mr. Awolowo led the Action Group, which was mainly Yoruba In the East Dr. Azikiwe led the National Council of Nigeria and the Cameroons (NCNC), which was mainly Ibo. In the North the Sardauna of Sokoto led the Northern People's Congress (NPC), which was essentially Muslim. By 1952 the Action Group and the NCNC were demanding 'independence by 1956', while the NPC, who feared that the Muslims of the North would be dominated by the Christians and Pagans of the South, wanted 'independence as soon as practicable'. This did not mean that the Action Group and the NCNC were agreed generally Though agreed about independence, they were in fierce competition for votes. These conflicts made the Constitution of 1951 unworkable, for it depended on the collaboration of all three Regions At a conference held in London in 1953 and in Lagos in 1954 substantial agreement was reached on a looser type of federation, which came into operation in October, 1954

At the London Conference in 1953 the representatives of the Eastern and Western Regions asked for self-government for the whole of Nigeria by 1956. The United Kingdom refused to fix a date for Nigeria as a whole, but agreed that in 1956 Her Majesty's Government 'would grant to those Regions which desired it full self-government in respect of all matters within the competence of the Regional Governments, with the proviso that there should be safeguards to ensure that the

Regional Governments did not act so as to impede or prejudice the exercise by the Federal Government of the functions assigned to it now, or as amended by agreement in the future, or in any way make the continuance of federation impossible'.[1]

This decision required further constitutional changes. It had been intended to hold another conference in London in October, 1956, but it was postponed because of an enquiry into the affairs of the African Continental Bank, in which Dr. Azikiwe was interested The Secretary of State refused to fix a date for the independence of Nigeria, but it was agreed that the Eastern and Western Regions should have self-government at once and the Northern Region in 1959. It was also agreed that the official members should be withdrawn from the Federal Executive Council. Mr. A. A. Tafawa Balewa (NPC) became Federal Prime Minister in August, 1957, with a Cabinet including representatives of all parties.

The conference resumed in London in October, 1958, when the reports of enquiries set up in 1957 were considered. It was agreed that the Northern Region should have self-government in 1959 and that the Federation of Nigeria should become an independent country within the Commonwealth in 1960 if, after a general election, the House of Assembly passed a resolution so requesting. The appropriate resolution was in fact passed, and Nigeria's independence was proclaimed on the 1st October, 1960. The appropriate legislation had been enacted by the Parliament of the United Kingdom in the Nigeria Independence Act, 1960; and the Commonwealth Prime Ministers had accepted Nigeria as a member of the Commonwealth It was agreed at a conference in May, 1960, that there should be a defence agreement between the United Kingdom and Nigeria, to be negotiated and ratified after independence.

The Constitution of the Federation is of the 'Dominion' type, with a Governor-General for the Federation and Governors for the Regions. There is responsible government of the

[1] Cmd. 8934, p. 11.

normal type both in the Federation and in the Regions. In respect of legislative power the Federation is weak because of the strong pressure for Regional autonomy exerted by tribal sympathies.

Sierra Leone

Sierra Leone was not only the first British colony in Africa, but also it was the first to give the vote to Africans, though the latter claim did not last long The territory's progress to self-government has been less spectacular than that of Ghana and Nigeria, for two reasons. First, there was a long conflict between the descendants of the freed slaves, for whose benefit the colony was established, and the inhabitants of the hinterland, many of whom had migrated to the colony. Secondly, the population of the territory has been small, and even now it is less than two million Until the discovery of diamonds it was doubtful whether the full apparatus of an independent State could be supported.

Granville Sharp intended Sierra Leone to be governed by what he believed to be an Anglo-Saxon system of 'frankpledge', or rotation of officers. It was not a success, and in 1790 Sierra Leone was given a Governor and a Council of eight members, responsible to the directors of the Sierra Leone Company. The settlers nevertheless claimed a power of legislation, which was ratified in 1798 by the setting up of a legislature of two houses. This system disappeared under the revised charter of 1800; and in 1807 Sierra Leone was annexed to the Crown by Act of Parliament. An advisory council was established in 1811, but it did not become a legislative council until 1863, when an executive council also was established The settlers therefore lost their elected representation in 1800 and did not again secure representation by election until 1924, the same year as in Nigeria, and an official majority was retained until 1952

The Sierra Leone Protectorate had been brought within the jurisdiction of the Legislative Council in 1913 The inhabitants of the colony claimed, however, that by reason of

their higher standard of education they were entitled to a larger share of representation than their share of the total population would justify They were eventually overruled, and once that decision had been taken progress could be rapid. In 1954 the unofficial members of the Executive Council were given the style of Ministers and were made responsible, in association with the heads of Departments, and subject to the control of the Executive Council, for Departmental business In 1956 the Legislative Council became the House of Representatives and was enlarged—again in spite of opposition from the colony—through a lowering of the franchise. The Sierra People's Party, whose leader was (Sir) Milton Margai, won the general election of 1957; and in 1958 it was agreed that a full Ministerial system should be established under a Prime Minister, to which office Sir Milton Margai was appointed. The Governor retained responsibility for defence, external affairs, internal security, the police and the public service until 1961, when the Sierra Leone Independence Act was passed and Sierra Leone became the twelfth independent member of the Commonwealth

As in other parts of tropical Africa, the mass of the population of Sierra Leone consists of subsistence farmers, their principal crop being rice Palm kernels are collected from the bush, where the palms grow wild As a State, however, Sierra Leone is able to balance its budget by reason of exports of iron ore and diamonds.

Central and East Africa generally

It has already been emphasized that, until 1888, it was no part of British policy to extend British jurisdiction in Africa, and this applied particularly to Central and East Africa. In 1880 Gladstone's Government refused an offer by the Sultan of Zanzibar to place his territories (which included a claim of right over an uncertain but substantial part of the mainland) under British protection. Indeed, in 1885, in return for support in Egypt, the Germans had been conceded a substantial sphere of influence in East Africa. Requests from traders and

missionaries for British protection in Uganda, Nyasaland and Zambesia (Northern Rhodesia) were rejected. German claims to wide areas in South-West Africa and Portuguese claims to wide areas in the hinterland of Mozambique were accepted; and but for protests from Cape Colony the two territories would have met in Central Africa. By the Pretoria Convention of 1881 the Boer Republic of the Transvaal was recognized, and under the London Convention it became the South African Republic

In spite of this deliberate attempt to limit commitments, British rule and jurisdiction were extended both in the South and in the North; and after 1886, when imperialism was the dominant political concept under Unionist rule, the process continued rapidly.

In the South the initial extension was due to the fear that German South-West Africa would extend to the borders of the South African Republic, whose farmers were in any case spreading among the Bechuana tribes to the west of the Transvaal. As a matter of high policy the British Government was anxious to keep the Boers and the Germans apart, and was therefore willing to attach Bechuanaland to Cape Colony. Rhodes was becoming prominent at the Cape and was developing his ambitious scheme for an all-British route from the Cape to Cairo On the other hand, the Cape politicians did not want to accept responsibility for Bechuanaland. In 1885, therefore, the part of Bechuanaland south of the Molopo River was annexed as British Bechuanaland, while the rest of Bechuanaland was declared to be a British Protectorate [1]

Meanwhile the British Government, in spite of its ructance to assume further responsibilities, had occupied Egypt. Anglo-French intervention in Egypt in 1879 had been due not to a desire to annex the territory but to an anxiety to put

[1] British Bechuanaland is now part of the Cape Province of the Republic of South Africa, while the Bechuanaland Protectorate is one of the High Commission territories, for which the Government of the United Kingdom is still responsible.

its finances in order and so protect the interests of bondholders The effort was made unavailing by the revolt of Colonel Ahmed Arabi against the Khedive. Both the British and the French were thrown into confusion by the rebellion, but the British Government eventually compromised, in 1882, by sending in an armed force to occupy the territory until the authority of the Khedive was restored. The French did not participate in these measures, which proved not to be temporary, and indeed after 1886 there was no anxiety to withdraw.

The reasons for the changed policy in Africa after 1886 have already been mentioned. In spite of all the talk about 'imperialism' Africa was for Great Britain of secondary importance. The real problem was the growing threat from the German Empire. The British Government did not want to run the risk of a European war arising through the 'scramble for Africa'. A series of agreements left within the British sphere of influence (apart from territories already under protection) Egypt, the Sudan, Uganda, British East Africa (Kenya), Nyasaland, Zambesia (Northern Rhodesia) and Matabeleland and Mashonaland (Southern Rhodesia) Since Parliament was unlikely to vote funds for development, the first steps were taken by the old device of chartered companies, the British South Africa Company in the South and the British East Africa Company in the East. The former, whose inspiration was the genius of Cecil Rhodes, was incorporated in 1889 with power to acquire concessions throughout what is now Rhodesia. The latter was incorporated in 1888 to acquire concessions in Uganda. Its failure led to proposals for the evacuation of Uganda in 1892, but in 1894 a protectorate was proclaimed. Meanwhile the Portuguese had laid claim to Nyasaland, but these claims had been withdrawn in 1891 and a British protectorate was proclaimed

Rhodesia and Nyasaland

Cecil Rhodes obtained a concession of mineral rights from the Matabele in 1885, and this enabled him to form the British

South Africa Company. It pushed settlers into Mashonaland in 1890, but war broke out with the Matabele in 1893. The defeat of the Matabele and the subsequent defeat of a Mashona rebellion left the way open for the settlement of what came to be known as Southern Rhodesia Before the end of the century, too, the Company had effective jurisdiction over North-West Rhodesia (i e. the western part of what is now Northern Rhodesia), subject to the rights of the Barotse within the area of land reserved to them In 1895, too, a division of responsibility between the Foreign Office, which controlled the protectorate of Nyasaland, and the Company was agreed upon In effect it left the rest of Northern Rhodesia to the Company, though North-West and North-East Rhodesia were not amalgamated until 1911. Meanwhile, Nyasaland had been transferred from the Foreign Office to the Colonial Office in 1904.

There were enough white settlers in Southern Rhodesia in 1898 to justify their representation in the Legislative Council established in that year, though the representatives of the Company had a majority. In 1911 the settlers were given a majority, and in 1921 it was agreed by the Colonial Office that Southern Rhodesia should have self-government, subject to a decision by referendum on the question whether the colony should be included in the Union of South Africa. In spite of the advocacy of General Smuts, the majority of the white inhabitants decided in favour of responsible government Accordingly, in 1923 Southern Rhodesia became a self-governing colony, with defence and external affairs vested in the United Kingdom, while Northern Rhodesia became a protectorate under the Crown The essential difference between the two Rhodesias was that Southern Rhodesia had a substantial white population, while the greater part of its labour force consisted of temporary migrants from Northern Rhodesia, Nyasaland and Portuguese territory. Northern Rhodesia had only a small European population and its labour force was for the most part indigenous. Subsequent development shifted the balance. In 1950 Southern Rhodesia

had a European population of 129,000 and an African population of 1,960,000, but of the Africans 260,000, or 59 per cent of all African employees, were migrants Northern Rhodesia had a European population of 36,000 and an African population of 1,849,000, and of the Africans some 34,000, or 20 per cent of all African employees, were migrants. Both Rhodesias were developing fast and had an acute shortage of labour, though in Northern Rhodesia this was due to the fact that of an estimated working population of 403,000 nearly 50,000 were away at work in Southern Rhodesia, the Union of South Africa, Tanganyika and the Belgian Congo On the other hand Nyasaland, with a labour force of some 200,000, employed only 70,000 of them in Nyasaland, while 82,000 were in Southern Rhodesia, 42,000 in the Union and 6,000 in Northern Rhodesia.

This interdependence in respect of African employment was one of the reasons for the establishment, in 1953, of the Federation of Rhodesia and Nyasaland The question of a closer union of the three territories had been discussed by a Royal Commission in 1938 The Commission anticipated that the territories would become interdependent, but did not propose amalgamation, for the following reasons

> 'First, that the native policies of the two northern territories and of Southern Rhodesia were in an experimental stage and that it was too soon to say which of these policies were in the long run more likely to promote the moral and material well-being of the African inhabitants, secondly, that there was general opposition to amalgamation among Africans in the northern territories, thirdly, that the European population of the three territories was not at that time ready, either in numbers or in experience, to discharge the responsibility of administering the combined territory, fourthly, the differing constitutional status of the three territories and the fact that, whereas Southern Rhodesia was self-governing, Northern Rhodesia and Nyasaland were Protectorates under an almost wholly

official form of government; and fifthly, the differing degrees of economic development of the three territories and the relative weakness of the financial resources of Northern Rhodesia and Nyasaland.'[1]

A conference of officials reported in 1951 that there had been improvement in respect of all these matters, except perhaps in respect of African opinion in the northern territories (though on certain conditions Africans 'might come to realize' the substantial advantages of closer association). The officials recommended the establishment of a Central African Federation with constitutional provisions for the protection of Africans

These proposals were considered at a conference at Victoria Falls in September, 1951, and were accepted by the United Kingdom Government in November, 1951 Though it was recognized that African opinion in the two northern territories was opposed to them, it was hoped that, in the light of the assurances agreed upon at the conference and the economic and other advantages of closer association, Africans would be prepared to accept them. These assurances were, first, that land and land settlement questions, as well as the political advancement of the peoples of the northern territories, should be the responsibility of the territorial authorities and not of the federal authorities Secondly, the two territories would remain as protectorates and there would be no amalgamation of the three territories of the federation unless a majority of the inhabitants desired it.

A further conference, at the political level, was held in London in April, 1952, though the African representatives from Northern Rhodesia and Nyasaland refused to attend either as delegates or as observers The conference worked out a draft federal scheme in some detail, but certain technical matters were referred to preparatory commissions The reports of these commissions having been received in October, 1952, a further conference was held in January, 1953. A

[1] As summarized in Cmd 8233 of 1951

federal scheme was approved, and it was accompanied by a report which read like an election manifesto.

> 'Closer political association between the three Central African Territories is essential if they are to develop their resources to the full and reach their proper stature in the world. Individually the Territories are vulnerable Their individual economies are ill-balanced and ill-equipped to withstand the strong economic pressures of a changing world Of the three Territories only Southern Rhodesia has any significant secondary industries, Northern Rhodesia is very largely dependent on her copper industry, which provides over four-fifths of her exports Nyasaland, an agricultural community, has to rely too much on a few primary products such as tobacco, tea and cotton and cannot develop herself unaided The economies of the three Territories are largely complementary, their closer association is essential if they are to achieve the economic and social development of which they are together capable.'[1]

The scheme proposed was federal The Constitution of the Federation was to be of 'Dominion' type, with a Governor-General and responsible government The Federation would be self-governing, but with some limitations. Southern Rhodesia would continue to have self-government in relation to territorial matters Northern Rhodesia and Nyasaland would continue to be protectorates, governed as before on behalf of the Colonial Office 'The association of the three Territories would enable the Federation, *when the inhabitants of the Territories so desire*, to go forwards with confidence towards the attainment of full membership of the Commonwealth '

The reason for the peculiarly argumentative form of the report was, no doubt, that the vocal Africans in all three territories were firmly opposed to the proposal. The British Labour Party, too, considered that the safeguards for the

[1] Cmd 8753 of 1953

Africans were inadequate Nevertheless, the scheme having been accepted by a majority of the electors at a referendum in Southern Rhodesia, and by Her Majesty's Government in the United Kingdom, the Federation of Rhodesia and Nyasaland was brought into existence in October 1953 with a Constitution authorized by the Rhodesia and Nyasaland Federation Act, 1953

East Africa

The tribes of East Africa, like those of Central and South Africa, are the results of migrations spread over thousands of years, followed by intermarriage. The degree of admixture varies considerably, both in respect of physical characteristics and in respect of ways of life, so that colour, language, economic pursuits and other tribal characteristics do not necessarily go together The migrations were continuing when the Europeans appeared on the scene. The effect of British administration was therefore to stabilize a social scene which had for many centuries been fluid. Boundaries became fixed, tribal lands became settled, and every tribe had to remain where it found itself, not to proceed on a career of migration and conquest. *Pax Britannica* inevitably meant the end of the essential characteristic of the African way of life. It also meant that the balance between men and nature was upset Tribal wars and slave-raiding had kept down the population but could no longer be tolerated; epidemics which from time to time decimated men or beasts were eradicated or controlled, famine and drought (which in Africa are much the same) called forth measures of relief and therefore no longer kept down the human and animal population; even the effects of the locust and the tsetse fly have been limited. If there was land-hunger before the European occupation it was met by migration or conquest. The rise in the population has made it endemic, and its consequences cannot (at least so long as British rule continues) be met by migration and conquest

On the other hand, the European has introduced new ways of living. Sir Philip Mitchell has thus described the

ignorance and backwardness of the peoples of Central and East Africa at the end of the nineteenth century

> 'Inland of the narrow coastal strip they had no units of government of any size or stability, indeed, with a few exceptions such as Buganda, nothing beyond local chiefs or patriarchs. They had no wheeled transport and, apart from the camels and donkeys of the pastoral nomads, no animal transport either; they had no roads or towns, no tools except small hand hoes, axes, wooden digging sticks and the like; no manufactures and no industrial products except the simplest domestic handiwork, no commerce as we understand it and no currency, although in some places barter of produce was facilitated by the use of small shells, they had never heard of working for wages They went stark naked or clad in the bark of trees or the skins of animals, and they had no means of writing, even by hieroglyphics, nor of numbering except by their fingers or making notches on a stick or knots in a piece of grass or fibre, they had no weights and measures of general use. . . There was a great variety of language or dialect largely within the great linguistic group now called "Bantu" by European scholars, and it was common, as it is today, for an area the size of an English county to contain several groups speaking different languages. They were pagan spirit or ancestor propitiators, in the grip of magic and witchcraft, their minds cribbed and confined by superstition.'[1]

As the East Africa Royal Commission commented 'There can be little wonder that the indigenous peoples of East Africa have experienced difficulty in spanning, in a matter of a few decades, the gap which it has taken the inhabitants of European countries centuries to bridge' It has, of course, been possible for an increasing number of Africans, but there are vast areas in which the change is imperceptible One result is

[1] East Africa Royal Commission Report, Cmd 9475, p 22

the extreme poverty of so many among the African population Most people live on subsistence farming or grazing, but, excluding those activities, the net money product per head of population (as estimated by the Royal Commission in 1955) was £8 in Tanganyika, £14 in Kenya, £15 in Uganda, whereas it was then £24 in the Congo, £34 in Ghana, £47 in the Rhodesias, and £101 in the Union of South Africa These figures do not include sums remitted abroad (e g by the migrant labourers of Southern Rhodesia) and they do not show the actual incomes; but they demonstrate how little western economy has affected the way of life of the people of East Africa.

One reason for this backwardness is the conservatism and parochialism of the tribes The Baganda are something of an exception because of their loyalty to the Kabaka, but generally the Africans think in terms of the smallest units, the family and the local tribal unit If land—even Crown land—is alienated for mineral or urban development it ceases to be available for tribal expansion and it is, to the tribe, irrelevant that opportunities for employment will be created, the demand for agricultural products stimulated, and generally the standard of living raised. This is so whether the entrepreneur is African or Asian or European It is as if the commoners of Wimbledon objected to the growth of London because they might at some time want to extend the grazing for their sheep. The resentment is even greater, however, in those parts of Kenya and Tanganyika in which land has been alienated to Europeans.

This attitude is not limited to Africans In 1923 it was decided that land in the Highlands of Kenya should not be alienated to Asians In 1935 it was assumed, rather than decided, that the land was reserved for persons of European descent The White Highlands, as they are now called, thus became a sort of tribal reserve, though more recently more flexibility has been allowed In Tanganyika there was no such specified area, but where land has been alienated to Europeans it is commonly regarded as 'European land' This, however, brings us to the subject of Asian and European migration.

Though Europeans were among the earlier discoverers of the coast of East Africa, there were Indian and Arab trading settlements before there were European settlements. The Portuguese had some connections with East Africa after 1498, but in 1729 they were expelled by the Arabs of Oman There followed a long period of conflict among the rulers of the coastal belt. In 1824 a British naval officer declared a British protectorate over Mombasa and neighbouring towns, but his action was repudiated After the separation of Zanzibar from Oman in 1856 the Sultans of Zanzibar made good their claim to the coastal belt Indeed, they also claimed a considerable jurisdiction inland, and the first European concessions were obtained from Zanzibar British interest in Zanzibar was due mainly to anxiety to suppress the slave trade, which was carried on by Arabs based on Zanzibar but ranging far inland Treaties with and political pressure on the Sultans proving unavailing, a blockade was threatened in 1873. Thereupon a new treaty was made, and the official trade in slaves was abolished, though there was still smuggling. Probably it did not completely disappear until Zanzibar came under British protection in 1890 Even then slavery remained legal in Zanzibar until it was formally abolished, under British pressure, in 1897. The slaves were not freed until 1911

The slave trade was also the main reason for British interest in Uganda Egyptians and Turks, as well as Arabs, raided for slaves in the Sudanese Province of Equatoria and in Uganda, and the efforts to put down the trade in the former were extended to the latter There were, too, both British (Protestant) and French (Roman Catholic) missions among the Baganda, in whose political controversies they became involved The British Imperial East Africa Company was chartered in 1888 to take over the concessions in East Africa and develop trade in Uganda Captain (afterwards Lord) Lugard pacified the country on its behalf, but the Company was financially a failure In 1894 a protectorate was declared over what is now Kenya Meanwhile, in 1890, an agreement with Germany resulted in the creation of German East Africa.

It was captured by Allied forces in 1916 and, with the exception of a small portion which came under Belgian rule, it became first the mandated territory and subsequently the trust territory of Tanganyika.

Uganda

When J H. Speke visited the Baganda in 1862 he found the strongest tribal organization in Africa, governed despotically by the Kabaka There was, however, a rival kingdom of Bunyoro, governed in the 'nineties by 'that aged scoundrel',[1] the Mukama Kabareya, who was at last captured in 1899 and his kingdom treated as conquered territory The Mukama had been hostile to all missionary or trading activity. The Kabaka Mtesa of Buganda had not been quite so favourable to missionary activity as Stanley had claimed in a letter to the *Daily Telegraph* in 1875, and he died in 1884, 'peevish and disgusted with the missionary squabbles and religious recriminations that buzzed in his ears, longing for the dear old easy pagan life that he had led before he had pressed Stanley to send him Christian teachers'[2] His son, Mwanga, expelled all the missionaries, though later, owing to a Muslim revolt, he took refuge with the Roman Catholic missionaries in the south and became a Christian. Since the French Catholics could not keep out of international politics, this did not help towards pacification, and a stable administration was not established until 1900, when Sir Harry Johnston made a treaty with the Kabaka. Similar treaties were made with the rulers of Ankole and Toro, but the system was not extended to Bunyoro until 1933.

The Uganda Agreement of 1900[3] set out in considerable detail the relations between the Baganda[4] on the one side and Her Majesty's Government and the Government of the

[1] Sir Harry Johnston, *The Colonization of Africa*, p 241.

[2] *Ibid*, p 239,

[3] Reproduced in Cmd 9028 of 1953, pp 14–23

[4] Buganda is the territory, Baganda the people, and Luganda the language

Uganda on the other side. In effect, Buganda became a province of the Protectorate, subject to the laws of the Protectorate, but governed internally by the custom of the Baganda. The arrangement worked reasonably well so long as the system of indirect rule prevailed It worked less well as Uganda developed and it became both necessary and desirable to contemplate the development of democratic institutions. The insistence of the Baganda, or at least of the Kabaka and his council, the Lukiko, on his ancient prerogatives then became an obstruction In 1953 the Secretary of State for the Colonies, in a speech, referred indiscreetly to the possibility of federating the East African territories. The Kabaka, Mutesa II, not only took exception to this reference but also asked for the independence of Buganda He was eventually satisfied that there would be no federation unless there was a substantial change in public opinion in Uganda, including that of the Baganda, but he refused to accept the Governor's formally tendered 'advice' (which he was bound to accept under the Agreement) to cease public opposition to the decisions and policies of Her Majesty's Government Thereupon Her Majesty's Government withdrew recognition of the Kabaka under the Uganda Agreement, and he was deported He was restored under the Buganda Agreement of 1955, saying that he looked forward to the 'self-government of Buganda within the framework of a self-governing Uganda'.

The Agreement of 1955 did not, however, end the conflict between the Baganda and the Government of Uganda. The Kabaka's Government refused to collaborate in the election of Baganda representatives to the Legislative Council in 1958 and petitioned the Queen for a termination of the Protectorate It also opposed the constitutional proposals of 1960, which would give Uganda a unitary and semi-self-governing Constitution. When the British Government nevertheless put the proposals into operation, the Lukiko declared the independence of Buganda—a declaration which the British Government considered to be illegal and therefore void under the Uganda Agreement

On the other hand, Uganda has avoided the essential problem of Kenya, the existence of large non-African areas of production Though official policy varied, at no time was there unrestricted alienation of lands to non-African immigrants. The Indians, who might have developed a plantation economy, in fact remained in the towns. Moreover, the collapse of the commodity markets in the 'twenties destroyed most of the non-African estates, while peasant cultivation, mainly of cotton and coffee, continued. It thus became possible for the Uganda Government to lay down the policy that the Crown lands, outside the townships and trading centres, were to be held in trust for the Africans.

Kenya

The British East African Protectorate, now known as Kenya, had no strong tribal organization like that of Uganda, and no mineral resources on which the development of the country could be based. Under the Imperial British East African Company it had been nothing more than a caravan route to the small port of Mombasa. Development had therefore to be at the expense of the United Kingdom. Since funds were limited, only the rudiments of an administration were established, and the first main task was to put down the endemic tribal warfare. The second task was the building of a railway from Mombasa to Lake Victoria It was begun in 1896 and completed in 1901. The cost was met from a loan from the United Kingdom, though later on the loan was converted into a gift

The railway was intended for the development of Uganda, but incidentally it made possible the development of Kenya. Indeed, a substantial part of the Uganda Protectorate, including the larger part of what became the White Highlands, was transferred to the East African Protectorate, and early in the present century the capital was shifted from the port of Mombasa to the railway town of Nairobi. The maintenance of the railway became the major responsibility of the Government of the Protectorate. To find something like £200,000 a year for the railway and to maintain an adequate administration

was impossible unless there was development, and the development had to be agricultural because no other natural resources were known. Lord Delamere, the pioneer of white settlement, first saw Kenya in 1897. By 1905, when the Protectorate was transferred to the Colonial Office, the settlers were numerous enough to form an association, in 1907 they were represented on the Legislative Council but even in 1914 there were only about 3,000 of them

The policy of white settlement was thought not to conflict with African interests. Famine, smallpox and rinderpest had kept the African population down, and there appeared to be enough land for all Perhaps it was not appreciated that the migratory habits of the tribes were due to the rapid impoverishment of land in tropical conditions, nor that British rule would cause the population to rise so rapidly that the White Highlands would become an African grievance. The White Highlands were in fact made white reserves because other areas were marked off as African reserves; and the reason for doing the latter was the fear that the Indians, some of whom had come in as traders and some as labourers and artisans, would settle on the land The White Highlands were reserved for Europeans because of the comparatively limited area of land suitable for European methods of cultivation.

The East African Protectorate was annexed to the Crown in 1920 and renamed the Colony of Kenya. Immigration both of Europeans and of Indians had been on a considerable scale after the end of the war of 1914–18, and questions of political development inevitably arose Both Europeans and Indians were given representation by communal elections in 1919, and in 1922 there was a proposal for a common roll. As a result of agitation by the Europeans the system of communal representation was retained. At the same time it was emphasized in the so-called Devonshire Declaration of 1923 that African interests were paramount.

'Primarily, Kenya is an African territory, and His Majesty's Government think that it is necessary definitely

to record their considered opinion that the interests of the African natives must be paramount, and that if, and when, those interests and the interests of the immigrant races should conflict, the former should prevail Obviously the interests of the other communities, European, Indian and Arab, must severally be safeguarded Whatever the circumstances in which the members of those communities have entered Kenya, there will be no drastic action or reversal of measures already introduced, such as may have been contemplated in some quarters, the result of which might destroy or impair the existing interests of those who have already settled in Kenya

But in the administration of Kenya His Majesty's Government regard themselves as exercising a trust on behalf of the African population, and they are unable to delegate this trust, the object of which may be defined as the protection and the advancement of the native races.'[1]

The object of this declaration was to prevent the development of the notion that the Europeans of Kenya would assume the responsibility for the government of Kenya as had been done in South Africa and as was being done in Southern Rhodesia. It was therefore expressed in 'racial' terms which were thought inappropriate even by those Europeans who were anxious to see the speedy development of African education and political advancement In their view, Kenya differed from the territories of West Africa and other territories in East Africa in that European enterprise had created it and was essential to its continuance as a political unit. They accepted the notion of a trust—which had been laid down by Edmund Burke and developed in the peace treaties of 1919—but thought that the trust would terminate not in African domination but in African, Asian and European co-operation In their view, the appropriate formula was not 'paramountcy' but 'partnership'.

[1] Cmd 1922.

As a result of these criticisms, the Government of the United Kingdom began to qualify the doctrine of 'paramountcy'. In June, 1930, Lord Passfield, as Colonial Secretary, accepted wholeheartedly the declaration of 1923, but proceeded to interpret it.[1] The creation and preservation of a field for the full development of native life was a first charge on any territory, but this was in no way incompatible with the common duty of any Government to develop the resources of the territory and the prosperity of its inhabitants, including the immigrant communities. This still did not satisfy the Kenya Europeans, and a new formula was found by the Joint Select Committee of both Houses on Closer Union on East Africa, which said.

> ' . . the doctrine of paramountcy means no more than that the interests of the overwhelming majority of the indigenous population should not be subordinated to those of a minority belonging to another race, however important in itself.'[2]

In 1948 the Secretary of State, Mr. Creech Jones, reaffirmed this statement in relation to Northern Rhodesia. When communicating this reaffirmation to the African Representative Council of Northern Rhodesia, the Secretary for Native Affairs said that the White Paper of 1923 (i.e. the doctrine of paramountcy) was 'dead' A question being asked in the House of Commons, the Secretary of State reaffirmed the interpretation of the Joint Select Committee. In the following year the Minister of State for Colonial Affairs said in the House of Lords

> 'It is our task . . to help the Africans to develop politically, socially and economically so that they can take their full part in the administration and development of the countries concerned, and in local and central

[1] Cmd 3573

[2] H C 156 of 1931.

> politics. . . . The true interests of all the people in these territories with mixed communities lie in mutual recognition of each other's needs. European and African interests in East and Central Africa are essentially complementary.'

'Paramountcy' has thus been replaced by 'partnership'; but this is not acceptable to extremist politicians, whether European or African. The former say, 'This is our country, we made it' The latter say, 'This is Africa, where African interests must predominate' This conflict of opinion is the essential problem of Kenya as well as that of Rhodesia.

Extreme African 'nationalism' (which, as was pointed out in Chapter 2, is really racialism) received its greatest and most violent expression in the Mau Mau rebellion of 1952. It was a highly organized rebellion among the Kikuyu, designed to eliminate the Europeans and the Asians and to take over the White Highlands as Kikuyu land. The African social system, both in the villages and in the European-established 'locations', makes intimidation easy. It was therefore difficult to separate the leaders of the movement from the innocent masses, and a long campaign was needed to stamp out Mau Mau. The rebellion retarded political and economic development in Kenya, though progress towards self-government has been rapid since 1958.

Closer union in East Africa

The boundaries of the three East African territories are even more artificial than most boundaries in Africa. The problems of the territories are similar if not the same Before 1947, while the responsibility for government was vested in the Governors, co-ordination was effected through regular conferences of the Governors. In 1948 the East Africa High Commission was established to operate common services, such as civil aviation, railways and harbours, posts and telecommunications, income tax, customs and excise, statistics, licences for industrial development, various forms of research, tourism, and the

Royal East African Navy. The Commissioners are the Governors of the three territories, and they have substantial legislative powers with the advice and consent of the East Africa Central Legislative Assembly. The Assembly was originally created for ten years, but it has been continued by resolutions of the three Legislative Councils. It consists of a Speaker, seven *ex officio* members, six nominated members (two appointed by each of the Governors), and twenty unofficial members, of whom nine are appointed by the Governors, two are appointed by the High Commission, and nine are elected by members of the High Commission

The advance of the territories towards self-government has called in question the future of the Commission Unofficial proposals for federation have been made, but the difficulties are at least as great as those in Central Africa.

7

RESPONSIBLE GOVERNMENT

It is sometimes assumed that, having lost the thirteen American colonies, Great Britain sat down in sackcloth and ashes, confessed her sins, resolved to be good ever after, and conferred responsible government on everybody. She did nothing of the kind. Indeed, the American colonies had not asked for responsible government. They knew nothing of it, though they knew a great deal about the corrupt Cabinet system of George III. Responsible government was first asked for in Canada after the Reform Act of 1832 had established responsible government on a firm basis in Great Britain. The device is simple, though it is not quite so simple in its operation. The conduct of affairs is vested in a Cabinet whose leaders are chosen from, and remain members of, the majority in the elected assembly. The Queen, or the Governor-General, sends for the leader of the majority and invites him to form an administration. He chooses colleagues who have the 'confidence' of the assembly and, so long as they keep their majority, executive and legislature act in sympathy, the one supporting the other. It was for this that Canada asked over a hundred years ago; it was for this that so many former colonies have asked since 1947

The person who introduced it to the colonies, however, was the fourth Earl of Durham, 'Radical Jack', the emissary of the Whig Government which was just dying a slow death when he issued his famous Report in 1839 Of the great galaxy of documents enshrined in the British Parliamentary Papers, the Durham Report was undoubtedly the most pregnant. It was the bible of the new imperialism, the imperialism which discovered that colonies could govern themselves and yet

remain colonies. 'Radical Jack' was sent to Canada in 1837 because, though Canada had been divided in 1791 and both parts given representative legislatures, the system was working badly. There was a minor rebellion in Lower Canada (Quebec) and a skirmish by a wild politician and a handful of men in Upper Canada (Ontario) 'Radical Jack' was given power to put things right, but he was soon at cross-purposes with the Home Government and resigned after five months. Meanwhile he had partly written and partly supervised the writing of his famous Report

His first propositions remind us of more modern problems. The difficulty in Canada, he asserted, was the conflict of races. The British policy had sought to divide them, though he said at once that the policy had not been carried out Instead of keeping Lower Canada wholly French, English settlers had been allowed to establish themselves there His policy was to swamp the French by the English, and for this purpose to unite the two Canadas. Constitutional reforms would not settle the matter. 'At the root of the disorder of Lower Canada, lies the conflict of the two races .. until that is settled, no good government is practicable, for whether the political institutions be reformed or left unchanged, whether the powers of the Government be entrusted to the majority or the minority, we may rest assured, that while the hostility of the races continues, whichever of them is entrusted with power, will use it for partial purposes.' Nevertheless, all the North American Provinces had very similar constitutions, and they all terminated in 'pretty nearly the same result' There must, therefore, also have been some defect in the form of government common to all.

That defect was that 'the natural state of government in all these colonies is that of collision between the executive and the representative body. . . . The Government is constantly proposing measures which the majority of the Assembly reject, and refusing its assent to bills which that body has passed ' At this point it becomes important that the Earl of Durham was 'Radical Jack', and the envoy of a Whig Government. Had he

been a Tory he might have advised 'strong measures'. Being a Radical, he produced all the Whig prejudices against 'irresponsible government' 'Since the Revolution of 1688, the stability of the English constitution has been secured by that wise principle of our Government which has vested the direction of the national policy, and the distribution of patronage, in the leaders of the Parliamentary majority.' That is not history, though it may be Whig history, but it is certainly Whig politics. 'It is difficult to understand how any English statesman could have imagined that representative and irresponsible government could be successfully combined.' Of course, it depends on the statesman. Even Disraeli, who began as a Radical, had recently written a pamphlet extolling the 'mixed' constitution in which the powers of the irresponsible and irremovable Crown were set out in all their glory. The views of 'Radical Jack' would not have been accepted by the statesmen, if they can be called so, who let George III lose America Still, the way of the reformer is to pretend that he is stating the obvious Responsible government was urged by Lord Durham in pained surprise that anybody should think anything else was possible.

Nevertheless—and this point is generally forgotten—Lord Durham did not suggest that all powers of government should be exercised by the Governor on the advice of responsible Ministers. There were substantial limitations The Imperial Government should determine 'the Constitution of the form of government—the regulation of foreign relations, and of trade with the mother country, the other British Colonies, and foreign nations—and the disposal of the public lands . . . A perfect subordination, on the part of the Colony, on these points, is secured by the advantages, which it finds in the continuation of its connection with the Empire.' In other respects, the policy of the colony must be determined by the colonists

> 'The colonists may not always know what laws are best for them, or which of their countrymen are the fittest for

conducting their affairs, but, at least, they have a greater interest in coming to a right judgment on these points, and will take greater pains to do so, than those whose welfare is very remotely and slightly affected by the good or bad legislation of these portions of the Empire. If the Colonists make bad laws, and select improper persons to conduct their affairs, they will generally be the only, always the greatest sufferers, and, like the people of other countries, they must bear the ills which they bring on themselves, until they choose to apply the remedy'

There, in a paragraph, is the case for colonial self-government.

A proposal so radical might easily have passed into the limbo of the forgotten. The major proposal, after all, was to unite the Canadas and swamp the French, and if this alone had been proposed, the Durham Report would have gone into the history books as a futile document, for the union of the Canadas was a failure and the French have never shown the slightest sign of being swamped. It happened, though, that a change of colonial policy was on the way The colonies had been tied to the mother country by strict commercial regulations which gave Great Britain a monopoly of much of their trade, though at the same time they had a preference in the British market. Adam Smith had shown sixty years before that neither monopolies nor preferences paid He had suggested that complete commercial freedom be given to the colonies. Slowly his ideas were accepted by the politicians. From the beginning of the nineteenth century there were relaxations. In 1846 the Corn Laws were repealed and Canada lost her preference over American wheat. In 1849 the last of the monopoly laws was repealed It is no coincidence that between those dates the North American colonies received the responsible government that Lord Durham had advised.

There were difficulties about it. The doctrinaires could not see how the Queen could be advised by two sets of Ministers Suppose her British Ministers decided one way and her

nadian Ministers the opposite? However, there was a slow velopment from 1839 In 1847 the new Lieutenant-Governor Nova Scotia was quietly instructed to put into operation at system of parliamentary government which has long evailed in the mother country'. The new Governor-General Canada had even more positive instructions. So responsible vernment went to North America, by a phrase in a Gover-r's pocket The change of atmosphere was immediate In election address Baldwin, who became in effect the first me Minister of United Canada, said.

> 'We shall have no more representatives of the sovereign making the doctrines of the Charleses and the Jameses the standard by which to govern British subjects in the nineteenth century . . henceforth their viceregal governments will be distinguished by adherence to the principles acknowledged by all parties in England—principles which will relieve Her Majesty's representative from the invidious position of the head of a party and will render him a living spirit, and the connecting link which binds this great colony to the parent state in affectionate and prosperous union.'

It is nevertheless true, as Lord Durham had pointed out, political devices do not destroy fundamental conflicts ponsible government was no doubt the Canadian answer to ything from 1837 to 1847, but from 1854 to 1864 it was wn not to be an answer at all. Responsible government uires responsible men, men who will subordinate sectional rests to national advantages. Canada had much to learn, Canada learned eventually, when John A Macdonald of ada West (Ontario) joined Etienne Cartier of Canada East ebec) to form the Liberal-Conservative Party which itually created the great Canadian Dominion It is a mentary on Lord Durham's plan to swamp the French that decisions were taken in Quebec with a French-Canadian iding and an Anglo-French coalition leading the discussions.

When Great Brıtaın accepts a polıcy, there is no further hesıtatıon about ıt. Durıng the 'fortıes there were numerous controversıes in Australia There were constıtutıonal dıscussıons ın whıch attempts were made to draw a dıstınctıon between 'local ınterests' and 'Impeııal ınterests'. They ended in 1855 when Tasmanıa, New South Wales and Vıctorıa receıved constıtutıons whıch ımplıed responsıble government, South Australıa followed ın 1856; and Queensland became a colony wıth responsıble government ın 1859. Western Australıa made no request untıl 1887, but ın 1890 ıt, too, receıved responsıble government In New Zealand matters went even more quıckly In 1840 ıt was annexed, ın 1856 ıt had responsible government. In South Afııca ıt was the Brıtısh Government whıch pressed because ıt wıshed to lımıt ıts commıtments. Cape Colony at length accepted responsıble government ın 1872 and Natal ın 1893

A new Empıre had been founded, an Empıre of a new type, an Empıre ın whıch Her Majesty the Queen had not one responsıble government but, at her Jubılee ın 1887, no less than seventeen—Unıted Kıngdom, Newfoundland, the Domınıon of Canada, Nova Scotıa, New Brunswıck, Prınce Edward Island, Quebec, Ontarıo, Manıtoba, Brıtısh Columbıa, New South Wales, Vıctorıa, Tasmanıa, South Australıa, Queensland, New Zealand and Cape Colony—and ıt was at the Jubılee that the Bııtısh people became aware of the fact and decıded that they weıe fine fellows afteı all How many there are today depends on what ıs meant by today, for the number fluctuates wıth a general tendency to rıse. At the latest count (1st June, 1961) there were 63, not countıng Pakıstan.

The condıtions of success

'Patrıotısm,' saıd Edıth Cavell, 'ıs not enough.' Nor ıs responsıble goveınment. It is characterıstıc of all colonıes that demand responsıble government that, so long as ıt is wıthheld, Great Bııtaın ıs the major enemy. She ıs, ındeed, a very convenıent enemy, for the hostılıty towards her whıch develops more strongly as the demands become more

vociferous serves to mask the conflicts of opinion and the divergencies of interest among those who shout the loudest. The essential problems of a colony are not its relations with Great Britain, but the social and economic conditions of the colony itself Self-government provides no bread-and-butter or rice-and-curry, it is not true, as is often alleged, that communal differences disappear when 'the third party', as Gandhi called her, is out of the way. This is no reason for refusing self-government, it is indeed a reason for advancing it The very fact that Great Britain becomes the enemy makes it to Britain's advantage to shorten the period of tutelage, the fact that attention is diverted from social and economic problems by attacks on Great Britain makes it desirable that the irrelevancy should be removed. As Lord Durham himself said, the colonists must bear the ills that they bring on themselves until they choose to apply the remedy They cannot apply the remedy until they realize the ills from which they suffer.

It is no doubt true that good government is not a substitute for self-government, but most colonies have discovered also that self-government does not necessarily produce good government Several times in the British Commonwealth responsible government has broken down completely. Newfoundland obtained self-government in 1855 but refused to be incorporated in the Dominion of Canada in 1868. It had serious economic difficulties, for it was dependent upon the fishing industry and the export trade which resulted from it. Even when the fishing was good the demand for fish might be affected by world economic conditions Newfoundland's difficulties were, however, aggravated by political action and especially by over-borrowing The depression of 1929–32 made it incapable of meeting its obligations, and in 1933 a Royal Commission recommended the suspension of the Constitution. This was done, and from 1933 to 1949 Newfoundland was governed by a Commission of Government presided over by the Governor. In 1949 it agreed to become the tenth of the Canadian Provinces Malta's experience has been even stormier. Responsible government, subject to immaterial

restrictions, was conferred at Malta's request in 1921 Its Constitution was based on the best precedents. By 1927 the two Chambers were in conflict, by 1929 the Government was in conflict with the Holy See, by 1930 it was attacking the Supreme Court, later in the same year the Constitution was suspended and a Royal Commission was sent out An amended Constitution was brought in in 1932, but a new conflict arose over official languages, a conflict which was at once a conflict of nationalism and a conflict of classes By November, 1933, the Constitution was virtually suspended, and from 1936 to 1947 Malta enjoyed—if that is the word—Crown Colony government In 1947 a dyarchical form of government was devised for Malta For most matters the Maltese Cabinet was responsible to the Maltese Legislature. For matters relating to defence, immigration, currency and external relations the Governor in Council was responsible to the Government of the United Kingdom The Prime Minister of Malta subsequently devised a very sensible scheme whereby Malta was to become a part of the United Kingdom with representation in the House of Commons Something of this kind was agreed on at an all-party Round Table Conference, presided over by the Lord Chancellor, in 1955, and constitutional details were worked out at a conference later in the year

The proposal for 'integration' was, however, founded on the assumption that the standard of living, the standard of social services and the level of taxation would gradually rise, in something like 20 years, to that in Great Britain This implied a substantial subsidy from the Treasury to the Maltese Government. It happened that the Treasury was engaged on an economy campaign designed to prevent inflation, and it differed from Mr Mintoff's estimate of Malta's needs by something like £5 million in a quinquennium. While this difference was being discussed it was announced that as a measure of economy the Naval dockyard in Malta would be closed Since the dockyard was Malta's biggest industry and the United Kingdom Government refused to guarantee employment for the displaced dockyard workers, negotiations

were broken off and Mr. Mintoff's Labour Party claimed independence for Malta.

Political conditions in Malta inevitably deteriorated In particular, a dispute between the Governor and the Prime Minister over the control of the police led to Mr Mintoff's resignation in April, 1956. Since no other party was able to form a Government, the Constitution was suspended, and at the end of 1960 it was still suspended.

Here, perhaps, an impartial observer would divide the blame. In India and Pakistan, however, it has proved necessary, or at least expedient, to suspend State Constitutions on several occasions. What is more, the new republican Constitution of Pakistan was suspended in 1958. The operation of responsible government in Pakistan would in any case be difficult because of the physical separation and the divergent traditions of East and West Pakistan Pakistan was from the beginning short of experienced men, both among the politicians and among the officials. The death of Jinnah in 1948 and the murder of Liaquat in 1951 were grievous losses In 1953 there were religious riots in Lahore which led to the dismissal of Nazimuddin by the Governor-General, Ghulam Mohamed. This caused a split in the Muslim League and made every subsequent Government an unstable coalition. A Constitution was at last approved in 1956, but it proved difficult to secure agreement on an electoral law. No election had been held when, in 1958, the President declared martial law, dismissed the Federal and Provincial Governments, and dissolved the National and Provincial Assemblies. A few days later the President himself resigned and was replaced by the Commander-in-Chief, General Ayub Khan Pakistan has since been under military rule.

Ceylon has managed to retain parliamentary institutions, though a rapid degeneration into anarchy was brought to an end in 1958 only by the personal intervention of the Governor-General Ghana has a Constitution which is parliamentary in form, though the gradual suppression of the Opposition makes it almost a one-party system of government Nor must it be

forgotten that Egypt, the Sudan, Jordan and Iraq have been under British rule and have tried, but failed, to work parliamentary institutions as independent countries.

These precedents serve as warnings There are others to serve as examples United Canada welcomed self-government in 1847, but from 1854 to 1864 it showed that responsible government was not enough The English had taught the French to form parties, but had not themselves learned that parties are merely groups of patriotic people aiming at the same ends by different means French Canada remained more French than Canadian, and as a consequence some of the men in English Canada became anti-Catholic and anti-French. Baldwin, of Canada West, found wild men on his right; Lafontaine, his partner in East Canada, and his successors found wild men on their left. Eventually John A. Macdonald of Canada West and Etienne Cartier of Canada East formed the great Liberal-Conservative Party, but even that combination could not solve the problems arising from the uneasy partnership of French and English Canada. The solution was found in a federated Dominion stretching from sea to sea, including French-Canadian Quebec as one of its autonomous Provinces. Thirty years later the Dominion of Canada had a French-Canadian Prime Minister.

The solution to the Canadian problem was the exact reverse of Lord Durham's, the recognition that the French-Canadian demand for *notre langue, nos institutions et nos lois* had to be met. Provided that was done, no conflict need arise between French and English Canada, and when it was done it became possible for Dominion politics to be based not on race, religion or language, but on issues on which the French as well as the English would divide Lord Elgin, the first Governor-General under responsible government, tried to teach the English-Canadians the lesson that unless they won Quebec they could not govern Canada, but it was John A. Macdonald ten years later who learned the lesson, and it is now fundamental to Canadian politics Once only has a party won a majority in Canada without winning a majority in Quebec. Yet Quebec

alone is not enough. it is the majority of the French in combination with some English-speaking sections which usually forms a Government.

Australia, too, has had her troubles. The Australian colonies had no real political parties capable of working responsible government as it was worked in Great Britain There were 'leaders' who had 'followers' who collectively were called 'parties', but they argued about personalities and not about principles. The result was instability Between 1856 and 1900 South Australia had forty-two Ministries, New South Wales had twenty-nine and Victoria twenty-eight There were no Lord Elgins to help them through their teething troubles and no John A. Macdonalds to bring in a larger vision. It was only with the establishment of the Commonwealth, when wider issues were necessarily brought before the combined electorate, that responsible government settled down Even so, there were thirteen Ministries in the first seventeen years and ten Ministries only in the next twenty-five The rise of the Australian Labour Party, in fact, put Australian politics on a firm economic basis

The Union of South Africa showed most clearly, however, how responsible government depends on the men who operate it What Rhodes and Hofmeyer did for Cape Colony through their realization that the Colony could be governed only by mutual toleration of British and Boer has already been emphasized They could not and did not prevent the Boer War The Liberal Government in Great Britain in 1906 fortunately realized that the only hope for South Africa lay in the South Africans themselves, and at the Durban Convention of 1907 the Boer generals sat down with the politicians of the Cape and Natal to hammer out a unitary constitution in which Boer and Briton could combine. The generals proved that they were also statesmen, and Generals Botha and Smuts —rebel generals according to English law—were among the ablest leaders that the British Commonwealth has thrown up. In 1917 a British Prime Minister summoned a Boer general to help win the war as a member of his War Cabinet

It must not be thought, however, that the wise generosity of 1906 had removed all sense of grievance, or fused the British and the Afrikaner into one people. Animosities do not die so easily, especially when witness is borne to them every day by differences of language and by differences of relations with the unenfranchised people of South Africa, called the Bantu by white South Africans and the Africans by everybody else. So long as Field-Marshal Smuts was alive and politically active there was some hope for liberal institutions in the Union. Indeed, the ruthless but inefficient form of political repression euphemistically called *apartheid* or 'separate development', which is now practised by the Nationalists in South Africa, must not banish from our memory the periods between 1926 and 1945 when some, at least, of the prominent Afrikaners could join the English-speaking South Africans in a statesmanlike and relatively (though only relatively) liberal policy. That section of Afrikaner opinion has not disappeared, though it lacks the leadership which Smuts gave it There are, indeed, signs of its continued growth The extreme Afrikaner was, and in large measure still is, an isolated Boer farmer, cultivating the soil with the aid of black labourers The electoral system is weighted in favour of the rural areas, and therefore the Boers seem to be more numerous than they actually are. During the last two decades, however, the Afrikaners have been moving into the professions and into industry. Their children, though educated through the medium of Afrikaans by Nationalist teachers and segregated by a Nationalist Church, nevertheless imbibe something of the cosmopolitan air of the cities. Nor can they be unaware that the ruthless enforcement of *apartheid* compels even white South Africans to live in a rather liberal, and not very efficient, police State

In other words, the position in South Africa is by no means static The segregation of education into 'racial' or linguistic streams does not, and probably cannot, prevent English from being a common language for at least a substantial minority, and so long as English is spoken, read and listened to on the radio the Union cannot be sealed off from a dynamic world.

What is more, outside influences percolate through the more liberal sections of the Dutch Reformed Church and the Universities of Pretoria and Stellenbosch. For these reasons the more liberal sections of Afrikaner opinion, favouring some limitation of *apartheid*, are neither inactive nor hopeless. *Apartheid* will break down through its inherent absurdity, which becomes more and more obvious as the African population living or working in the cities becomes more numerous.

This kind of emphasis on 'race' is not limited to Europeans In India the Congress Party, which is still dominated by the liberal ideas of Jawaharlal Nehru, has had to give way to a demand for linguistic States which threatens to balkanize India. In Pakistan before 1958 the political conflict was in substantial degree a conflict between Punjabi and Bengali. In Ceylon communalism became dominant when S. W. R. D. Bandaranaike, who was a racialist, won the general election of 1956. He discovered a truth which is now becoming obvious elsewhere, that national sentiment does not go deep into the population, and that it is possible to achieve a majority by capitalizing the prejudices of the illiterate or semi-literate electors He therefore helped to destroy the foundation on which parliamentary institutions were built in Ceylon, the co-operation of the Sinhalese, the Tamils and the Muslims in non-communal parties.

Responsible government is not easily worked, even among a people so homogeneous as the English, the Welsh, the Scots and the Ulstermen have become. It works only because of mutual tolerance and understanding, and because it is realized that sectional interests have to be submerged in the larger patriotism. Where these sectional interests are strengthened by ancestral loyalties, differences of religion, and varieties of language, it becomes even more difficult

The extension of responsible government

Lord Durham thought of responsible government as applying to internal matters only. He excluded from it all external relations and he mentioned particularly the form of

government, the disposal of public lands, the relations of trade and the conduct of external affairs. When responsible government has once been established, however, its area tends inevitably to become enlarged It is not practicable, as the British Government pointed out to the Australian colonies in 1850, and as Malta showed in 1930, to divide internal from external affairs. They react the one upon the other. Even language policy, as Malta proved, can create diplomatic controversies. The control of tariffs, as Canada pointed out in 1871, is an essential part of internal economic policy The control of immigration is essentially a matter of external policy, but it is equally a part of internal economic policy. It has therefore proved impossible to maintain Lord Durham's distinction; and all aspects of policy, external as well as internal, have gradually come within the sphere of self-government.

Control over constitutional machinery disappeared very soon. The Canadian Constitution of 1867 contained no power of amendment and, until 1949, all efforts to find an agreed process broke down owing to the reluctance of Quebec to allow a majority to modify its autonomy. In 1949 it was agreed that the Parliament of Canada should have power to amend all the provisions in which Quebec was not specially concerned, and the necessary powers were conferred, at the request of Canada, by an Act of the Parliament of the United Kingdom For all amendments relating to the federal structure, however, Canada must still approach the United Kingdom Canada, therefore, has still to ask the Parliament of the United Kingdom to enact amendments of the Canadian Constitution. The Commonwealth Constitution of 1900, however, provides for its amendment in Australia, and no reference need be made to Great Britain. Britain has never had control of constitutional machinery in any other Commonwealth country since 1947. In New Zealand the limitations were removed by the Parliament of the United Kingdom, at the request of the Parliament of New Zealand, in 1947

The problems of tariff control became easier when Great

Britain accepted the principles of free trade. Control of customs legislation was conceded generally in 1857, and when free-trade Britain protested against Canadian tariffs in 1871 it was very properly rapped over the knuckles. Control over immigration was allowed to the Australian colonies by 1862, even though Great Britain could not approve of the 'White Australia' policy which they wished to apply and that policy might lead to international difficulties. Australia's economic problems compelled Great Britain to give up control over Crown lands before 1870 By 1911 responsible government really included everything except defence and external relations and certain matters, including British nationality and merchant shipping, which were covered by Imperial legislation By 1914 the Dominions could, in fact if not in form, make their own commercial treaties, and by 1920 all aspects of policy, external as well as internal, had come under Dominion control.

In 1926, therefore, Great Britain and the Dominions were able to lay down a general proposition in the famous Balfour Declaration

> 'They are autonomous communities within the British Empire, equal in status, in no way subordinate one to another in any aspect of their domestic or external affairs, though united by a common allegiance to the Crown, and freely associated as members of the British Commonwealth of Nations.'

Like most general statements, this Declaration asks more questions than it answers It was admitted, too, that there were many relics of past subordination Some of them, indeed, subsist in some Commonwealth countries to this day The task of removing these relics, where they were felt to be an impediment to nationalism, was undertaken between 1926 and 1931, and the legal powers necessary for their removal were conferred by the Statute of Westminster in 1931 Similar powers have been given by the Independence Acts of the more recently erected Commonwealth countries

8

FREE ASSOCIATION

MAN cannot live by bread alone, but he finds it difficult to live without cereals At the other extreme patriotism is not enough, but it is difficult to maintain a political entity without it. Sentiment and material interest commonly go together, and nothing is more difficult than to separate motives. It might be said that the Scot became a good Briton because it paid him, whereas the Irishman did not because it did not or it might be said that the Scot possessed a larger patriotism while the Irishman's affections could not cross the Irish Sea What can be said with truth is that the peoples of the United Kingdom, as at present constituted, have attained in the course of centuries a unity of purpose, a common loyalty and a tradition of national service which is hardly surpassed in any other country. Whatever controversies be raging, at the first sign of danger the ranks are closed, however wide be the divergences of racial origin, of cultural tradition, and even of language, we all know that we can rely on our own people, however broad our sympathies and international our outlook, it is assumed that the first duty is to the nation

This patriotic sentiment is, of course, deliberately fomented It has, strangely enough, few of the insignia of nationalism. Though nearly everybody speaks English, the first people in the British Isles to declare that English was an official langauge were, by an irony of history, the Irish There is, strictly speaking, no national flag; for the Union Jack is merely a flag to be flown, in certain circumstances, by the ships of the Royal Navy On the one hand it is a flag which any British subject may very properly fly; on the other he may fly any other flag (subject to some limitations) he pleases. If he wishes

to show his particular loyalty to England or Wales or Scotland or New Zealand or India, nobody raises objections. Then, too, we have no national anthem. It is true that the hymn *God Save the Queen* is sung in the United Kingdom, but it says nothing whatever about the United Kingdom. It is true also that *Rule Britannia* and *Land of Hope and Glory* are sometimes sung, but they have less official status than *Land of our Fathers*, or *O Canada*, or *Advance Australia* We have, indeed, no name for a citizen of the United Kingdom. The Americans call him a 'Britisher', but he calls himself nothing at all Under the British Nationality Act, 1948, he is a 'citizen of the United Kingdom and Colonies' as well as a British subject, but, as the name implies, this applies to persons in the colonies as well as to those in the United Kingdom, also, the status is purely formal—it means only that he carries a passport issued by the Foreign Office or a Colonial Government, and in other respects it confers no rights which are not available to a citizen of any other Commonwealth country. Any British subject may exercise the franchise, stand for election to the House of Commons, or receive a peerage and sit in the House of Lords.

There is significance in all this. On the one hand there is no country in the world that can surpass the national tradition of the United Kingdom, on the other hand the citizen of the United Kingdom shares that tradition with British subjects wherever they may be and whatever be their race, creed, language, colour, class or caste There are six or seven hundred million British subjects, every one of whom may, if he pleases, fly the Union Jack, sing the National Anthem, seek the protection of the officials of the Crown, become a candidate for election to the House of Commons, or aspire to a peerage. There are occasions when the law differentiates between a person resident or domiciled in the United Kingdom and a person not resident or domiciled in the United Kingdom, but in principle no distinction is drawn. There is no British race, no British language (in the British Isles themselves six languages are spoken) and no British religion (the Church of

England is 'established' in England and the Church of Scotland in Scotland, but no Church is established elsewhere, even in Wales) There is, however, a British nationality shared by six or seven hundred million people of all races, languages and religions At the same time there are also local nationalities in each of the independent countries How far this local nationality carries privileges which are not available to other British subjects depends upon local legislation. In the United Kingdom there are no substantial distinctions, but elsewhere political privileges are usually reserved to local citizens, and sometimes, as in Ceylon, local citizenship may be difficult to obtain.

The extent to which these six or seven hundred million British subjects share the patriotic sentiments of the fifty million people of the United Kingdom, however, varies enormously. In the United Kingdom itself these sentiments are nourished by all the instruments of propaganda, official and unofficial. The children are taught to be citizens of the world, but as subjects of the Queen Large parts of English literature, and not least the plays of Shakespeare, ring with patriotic fervour. In times of stress the appeal to patriotism never fails. The United States of America have shown that these sentiments do not go very deep, for British emigrants have become good American citizens as quickly as what Kipling called 'lesser breeds without the law'. Nevertheless, in the right environment the national tradition is handed down from generation to generation, and indeed British emigrants who acquire no new and competing national tradition tend to be more demonstrative in their patriotism than those who stay at home Big Ben 'thrills' in the outposts of Empire far more than in the City of Westminster.

When British people settled in colonies, therefore, they took with them, and have retained through generations, the patriotic sentiments which flourished at home. Usually, too, they kept some at least of their contacts with the mother country. It is easier now, when London calls the world over the air, but even in the days of the windjammer they read or

heard the news that came, directly or indirectly, from home In the schools their children have been taught the sort of pacific unaggressive nationalism that is taught in the schools of the United Kingdom Immigrants from other countries have acquired in the course of a generation the same patriotic sentiments In due course, however, the content began to vary 'Oh to be in England now that April's there' has force only to one who has been in England, while Loch Lomond and Harlech become merely words in songs. The national beauties of Great Britain are replaced by the local beauties, perhaps grander and more exotic than those at 'Home' There grows up, too, a set of traditions—stories, verses, poems—which eventually becomes a full-fledged literature In the British tradition, games play a great part in stimulating patriotism. 'Collapse of Australia' refers only to a cricket match, but there are many for whom that word 'only' is almost a national insult. In short, there grows up in a settled colony a nationalism within a nationalism, a Canadian, Australian and New Zealand nationalism, which is nowhere inconsistent with the wider British nationalism and is indeed part of it because British nationalism is so wide The Australian can be a good Australian and yet a loyal British subject, just as the Welshman or a Scot can be a good Welshman or Scot.

The exact relationship varies somewhat from place to place Canadian nationalism is affected partly by the French-Canadians and partly by close contacts with the United States. In Australia there has been a larger growth of what is usually described as left-wing opinion, which tends to suspect any institution which passes under the description of 'imperial'. New Zealand, on the other hand, has maintained an affection for the mother country In any event, all this applies only to those of British descent and to those who have been fully absorbed into communities sharing the British tradition. It cannot apply to the French-Canadians or the indigenous peoples of Asia and Africa. Each of these needs to be treated separately

The French-Canadians lost all contact with France nearly

200 years ago. They have, indeed, little sympathy with anti-clerical, Revolutionary France They are intensely Canadian, and they call themselves the *Canadiens*, while the other Canadians are to them the English Under the British flag, however, they have attained autonomy, tolerance, freedom to organize their lives according to their own laws, civil and religious, liberty to use their own language They distrust, as the English-Canadians do not, the influence of the great American republic They are isolationist and nationalist and yet they cherish the link with the British Crown in whose name they twice defended Canada long ago. On the one hand, therefore, they strengthen Canadian nationalism, on the other hand, they are at least as eager to retain membership of the British Commonwealth, though they are less eager than their fellow-countrymen to accept obligations on its behalf So Canada has been able to develop as a nation under the British flag, speaking English in nine Provinces and French in the tenth, proud of her differentiation both from 'the old Country' and from the United States.

Loyalty to Canada is learned in Canada as loyalty to Wales and Scotland are learned The Canadians are less than half British by descent, but their loyalty to their own country includes a remoter loyalty to Queen and Commonwealth That remoter loyalty, too, has been strengthened by the sacrifices which Canadians have made on its behalf for it is true of nations as of individuals, that it is not gratitude but service that binds In two successive wars—it is unnecessary to include the Boer War—Canadian forces have crossed the Atlantic to help defend 'the Old Country' In the sad days of 1940 Canada, foremost among the Dominions, supported 'the Old Country' when, apart from the Dominions, she stood alone facing a relentless and victorious foe There was no question even of 'Lease-Lend', it was an outright gift of men, munitions, warships, food and raw materials. There were no difficulties over dollar exchange so long as they were Canadian dollars. If the need had arisen, there would have been, in Canada, an asylum for the King and his Ministers of the

United Kingdom until, as Mr Churchill put it in his famous 'never surrender' speech, 'in God's good time, the New World, with all its power and might, steps forth to the rescue and the liberation of the Old'. Canada in those days proved herself not only a nation, but also a nation with courage and initiative Because her assistance was so effective and perhaps, decisive, there can be no suspicion in the mind of any Canadian that membership of the Commonwealth implies any subordination to Great Britain and it is fear of that implication which might break the Commonwealth, for nationalism is stronger than the sentimental link which binds Canada to Queen and Commonwealth, and if there is any inconsistency between them it is the link that will break.

Of the four hundred and fifty million people in the four Asian countries of the Commonwealth, few claim descent from the peoples of the United Kingdom. The peoples of India and Ceylon and the Chinese of Malaya and Singapore derive from civilizations far older than those of Europe The Muslims of all four countries have a common sentiment with other Muslims in Asia and Africa On the other hand, neither India nor Pakistan was a political unit before 1947, Ceylon was not a political unit, except under British rule, for seven hundred years, and Malaya was a collection of competing principalities until it was united under British rule. The nationalist sentiments which have now developed, so strongly that they sometimes savour of Chauvinism, arose under British rule and through the medium of the English language. The Constitutions of the four countries are essentially British because their constitutional ideas derive from the United Kingdom Though indigenous literatures are developing, the educated classes derive the greater part of their education through English. Though other British subjects are generally regarded as 'foreigners' they are in fact treated differently from non-British aliens Most of the world's news reaches Karachi and Dacca, Calcutta and Bombay, Madras and Colombo, Kuala Lumpur and Singapore, via London. The more prominent newspapers are in English The external relations between the

academic and professional bodies in all those countries are mainly with those of the United Kingdom Britain thus has an attraction which is only partially offset by its being the home of 'British imperialism' or 'Colonialism'. It is neither 'Home' nor 'the Old Country', but it is the country which most educated Indians, Pakistanis, Ceylonese and Malayans hope to visit, and indeed many of them are graduates of universities in the United Kingdom or members of British professional bodies. Ambitious men and women parade their 'British qualifications' and, even when political antagonism is at its highest, British precedents are quoted and British standards emulated.

In Africa too, whatever unity exists is of British manufacture. The purely African cultures, as distinct from those which came in with Islam, Christianity and Hinduism, remained primitive until the European infiltration. In the Commonwealth countries from the Gambia to Kenya and Tanganyika all social and political institutions, other than tribal, Islamic and Indian institutions, are of British origin The only common language in any of those countries is English, and all secondary and higher education has to be given in English. Indeed, the school examinations are those of Cambridge and London and the university examinations are those of London Professional qualifications derive from England Every building of brick, stone or concrete, every macadamized road, every wheeled vehicle, is a monument to British rule Not only all the laws (apart from tribal custom and Islamic law) and political institutions, but also the concepts on which they are based, came from Britain These peoples now have lives of their own and their institutions will diverge from their prototypes, but they exist because of British rule, and their contacts with Britain will necessarily remain close for two or three generations

On the whole, too, British ideas have changed with the times The people of the United Kingdom became aware, late in the nineteenth century, that their white colonies were no longer colonies but nations. During the first twenty years of

this century the lesson was driven home with increasing vigour. Sir Wilfrid Laurier and Sir Robert Borden of Canada, Mr. Deakin and Mr. Hughes of Australia, Mr Seddon and Mr. Ward of New Zealand, and Generals Botha and Smuts of South Africa could not be treated as 'one of us'. The slightly contemptuous implication of 'colonial' disappeared as 'Dominions' became the rule. The acceptance of equality with the 'natives' of Asia and Africa proved more difficult because of the old prejudice against pigmented skins which began, apparently, when the fair-skinned Aryans invaded India some 2,500 years ago There are still 'Poona wallahs' of an older generation, as well as London landladies, to whom a dark skin is a sign of inferiority This problem is accentuated, too, by differences in social conventions The most obvious of them is disappearing as the women become emancipated, but there are others which are not likely to disappear for generations if not centuries The social conventions of Europe and America are neither better nor worse than those of Asia and Africa, but they are often different, and they necessarily affect social and therefore political relationships On the other hand, the ordinary citizen of the United Kingdom is a very adaptable person, because he is cosmopolitan and lacks the capacity to maintain historic grievances His remarkable capacity for minding his own business sometimes makes him seem standoffish but—now that he is no longer in a position of official superiority—it also enables him to leave to the new Caesars the things that are Caesars'.

The legal forms, too, have shown themselves singularly adaptable to the creation of nations within a Commonwealth. While the authority of the Government and the Parliament of the United Kingdom had to be removed, it has proved possible to adapt the monarchy to the new situation. This was done by making a clear differentiation between the monarch and the Government The idea was by no means new, for it developed in the United Kingdom itself during the eighteenth and nineteenth centuries Party government implies that a substantial section of opinion is always against the Government, whatever

be its political complexion. Opposition can be made consistent with patriotism only by distinguishing loyalty to the party from loyalty to the State and in a monarchy the latter loyalty can easily be personified in the monarch A British subject can thus damn his Government and yet serve the Queen It is, however, equally possible for two British subjects to serve different Governments and yet serve the Queen. The independence of the several portions of the Commonwealth is thus consistent with loyalty to a single Queen. The effect of the changes from 1926 to 1931 was to bring this idea into operation The Queen has separate Governments in the United Kingdom, Canada, Australia, New Zealand, Ceylon, Nigeria, Sierra Leone and Rhodesia and Nyasaland, each of them acting independently but in her name. Except in the United Kingdom she usually acts through a Governor-General appointed by her on the advice of the Government concerned He is therefore the representative not of the Government of the United Kingdom but of the Queen, and he acts on the advice of the local Ministers without advice or control from the United Kingdom.

Even some of the trappings of monarchy have been found to be easily adaptable. Whenever the Queen is present the Royal Standard may be flown, and when she is not present it may not be flown. It is thus as much the flag of any other Commonwealth monarchy as of the United Kingdom The Governor-General, too, flies his own flag. Each Commonwealth monarchy may thus establish its own flag or adapt the Union Jack, or fly both the Union Jack and its own flag on suitable occasions. The National Anthem is not a national anthem but a royal hymn which may be sung wherever the Queen's writ runs, and it may be sung alone or in association with *O Canada*, or *Advance Australia*, or *Namo, Namo, Matha.*

So great was the emphasis upon the unity of the monarchy that it was doubted whether a Commonwealth country could become a republic Even this proved possible, however, when India became a republic in 1950 Pakistan, Ghana and Cyprus have followed this example, while Ceylon has decided to do

so. The Malay States were never territories of the Crown, and so the Federation of Malaya has its own peculiar sort of monarchy. Thus in some countries of the Commonwealth the Queen is both Queen and Head of the Commonwealth. In others she is only Head of the Commonwealth.

The British Commonwealth is not a State. It is a collection of nations associated for a few purposes but dissociated for most. It is a new sort of entity that was not in the books. It was not a British invention; it was, if responsibility can be allocated, a Canadian, South African and Irish invention. Sir Wilfrid Laurier of Canada, Generals Smuts and Hertzog of South Africa and Mr De Valera of Eire have been its chief architects, though they were odd architects who built without a plan A French-Canadian, two Afrikaners and a Spanish-Irishman share the major part of the credit, if there be credit, because they were concerned essentially with the problems of the Commonwealth from the peculiar angles of their peoples. The British contribution has been tolerance and an infinite capacity for acting as father where necessity is the mother.

9

A DIGRESSION ABOUT LAWS

IT IS the function of a lawyer to make certain that the politicians get what they want What the politicians wanted in the British Commonwealth was to convert a colonial Empire into a Commonwealth of free peoples It was a responsible task, for Empires have been lost over lawyers' quibbles Though some have asserted the contrary, an English lawyer would be bound to say that the American Declaration of Independence was a recital of bad law, whatever be its merits as a political manifesto. Fortunately, since 1783 the principle has been established that law was made for man and not man for the law, and that if law stood in the way the simple solution was to change it.

The Americans contested the principle that the Parliament of the United Kingdom could make laws for a colony Great Britain stood firm, too firm, and the American colonies were lost. Thenceforth, however, Parliament made laws for the colonies with due discrimination Generally, it did no more than provide them with representative Constitutions and enact laws of general concern. With the acceptance of free trade in Great Britain the temptation to regulate their trade by Imperial legislation disappeared; and indeed Parliament looked on with the pained surprise of an eager convert when they decided to regulate it themselves. Even the imperial preference that Canada freely offered was regarded almost with disapproval, as if a burglar had offered 5 per cent of his takings to charity However, the rule that Parliament could legislate for a colony was maintained and it was reaffirmed in the Colonial Laws Validity Act of 1865, where it was provided that any Act of a colonial Parliament which was repugnant to

an Imperial Act applying to the colony was void and inoperative. It is true that after 1911 no Imperial Act was applied to a self-governing colony unless it asked for it—as for example in matters of common concern like British nationality, the recognition of bankruptcy decrees and other orders of courts, the surrender of offenders, merchant shipping, and so on The Parliament of the United Kingdom thus became at once the legislature of the United Kingdom and the legislature of the Commonwealth on matters of common concern. Once the principle had been established that the self-governing colonies must be consulted, there was no hardship in it, but there was older legislation still in operation, and in any case, since the United Kingdom could legislate for a Dominion and the Dominion could not legislate for the United Kingdom, there was no equality of status

Accordingly, the Statute of Westminster in 1931 repealed the Colonial Laws Validity Act in so far as it applied to Canada, Australia, New Zealand, South Africa and Newfoundland and authorized the Parliament of a Dominion (including, for this purpose, the Irish Free State) to repeal or amend Imperial Acts applying to the Dominion. It further enacted—though as a matter of law its value is somewhat doubtful—that an Act of the Parliament of the United Kingdom should not extend, or be deemed to extend, to a Dominion as part of the law of that Dominion, unless it was expressly declared in that Act that that Dominion had requested, and consented to, the enactment thereof. This provision was supported by a declaration in the preamble—which operates as a sort of gentleman's agreement—that no law made by the United Kingdom Parliament should extend to any Dominion as part of the law of that Dominion otherwise than at the request and with the consent of that Dominion

These provisions gave rise to difficulties. The King held his throne by virtue of an Act of Parliament, the Act of Settlement, 1701, which applied to the Dominions as part of the laws of the Dominions If the Dominions could repeal imperial legislation could they not establish their own King, and so

break up the Commonwealth? Accordingly another gentleman's agreement was inserted in the preamble Any alteration in the succession to the Throne or the royal style and titles was to require the assent of the Parliaments of all the Dominions as well as of the Parliament of the United Kingdom So there was to be one King, but the succession was to be arranged by concurrent legislation.

The problem became real sooner than anybody had anticipated. On the 10th December, 1936, Edward VIII executed an 'instrument of abdication' The Parliament of the United Kingdom was in session and His Majesty's Declaration of Abdication Bill was read a first time The Canadian Parliament was in recess and could not be summoned, so the Canadian Privy Council gave Canada's 'request and consent'. On the 11th the Australian Parliament met and passed resolutions assenting to the Bill, which was passed by the Parliament of the United Kingdom the same day, reciting the 'request and consent' of Canada and the 'assent' of Australia, New Zealand and South Africa. Since the provisions of the Statute of Westminster had (at their request) not been applied to Australia and New Zealand, no 'request and consent' was legally required from them, but the New Zealand Parliament subsequently approved. When the South African Parliament next met, it passed legislation retrospectively to alter the succession from the date of abdication, i.e. 10th December, 1936 The Oireachtas of the Irish Free State passed the necessary Act on 12th December. So George VI, legally at least, reigned in South Africa from 10th December, in Eire (or, strictly, in relation to Eire) from 12th December, and elsewhere in the Commonwealth from 11th December. Such were the legal complications of a Commonwealth which then contained seven nations.

There were other difficulties. The Constitutions of all the Dominions except Newfoundland were in Acts of Parliament. If the Dominion Parliaments could repeal or amend Acts of Parliament they could repeal or amend their own Constitutions. The Canadian Provinces did not wish the Dominion

Parliament to alter the Canadian Constitution, and so, at the request of Canada, a provision was inserted to prevent such amendments. Australia could amend her Constitution, but only in a specified manner, and the 'preliminary clauses' which provide for federation could not be amended at all, and so at the request of Australia it was provided that no such amendment should be made. Certain provisions of the New Zealand Constitution could not be amended unless the Bill was 'reserved' for the King's personal assent, and so at the request of New Zealand it was provided that no amendment should be made except under the existing law In fact, Australia and New Zealand did not then want the powers of the Statute. They had never asked for them, but they acquiesced because South Africa and the Irish Free State wanted the Statute enacted. The application of the main provisions was therefore suspended in relation to Australia, New Zealand and Newfoundland until they were 'adopted' by the Parliament concerned, as they now have been, because Australia and New Zealand did so 'adopt' the Act and Newfoundland has been incorporated in Canada.

There were other limitations on legislative power. No Dominion could enact legislation outside its own territory unless it was necessary for the 'peace, order and good government' of the Dominions. It could not, for instance, deal with offences committed by Dominion citizens in other countries. The Parliament of the United Kingdom, on the other hand, had an unlimited legislative power. Accordingly, the Statute of Westminster empowers each legislature to legislate 'extraterritorially'.

Every Dominion Constitution, again, empowered the Governor-General to 'reserve' a Bill for the King's personal assent. This used to mean that the Bill did not become law unless the Secretary of State for the Dominions advised the King to assent It was agreed in 1926 that the 'advice' should be not that of the Secretary of State but that of the Dominion Ministers, and in 1930 it was agreed that the necessary amendments could be made to remove the power altogether Again, every Dominion Constitution except that of the Irish Free

State enabled the King to 'disallow' Dominion legislation, i.e. to declare it null and void. It was agreed in 1926 that the King should act only on the advice of his Dominion Ministers, and in 1930 that any Dominion could secure the removal of the clause from its Constitution.

The formal legal equality sought to be obtained by the Imperial Conferences of 1926 and 1930 and the Statute of Westminster really resulted in a wide variation in 'Dominion status' in the legal sense. Eire used the powers of the Statute to bring into operation what was virtually a republican Constitution and then to secede from the Commonwealth. South Africa used it to produce a formal equality between South Africa and the United Kingdom, and indeed it was General Hertzog who pressed for its enactment. The conversion of the Union into the Republic of South Africa and the secession of that Republic from the Commonwealth was effected legally under the Statute of Westminster. Canada used the Statute to give the Dominion and Provincial legislatures power to amend imperial legislation and to empower the Parliament of the Dominion to legislate extraterritorially. Australia, New Zealand and Newfoundland at first did not use it at all, but after the war Australia used it to acquire extraterritorial legislative power and New Zealand to amend its Constitution (though additional legislative powers had to be obtained for this purpose from the United Kingdom).

The Statute of Westminster applied only to the Dominions as there listed, namely Canada, Australia, New Zealand, South Africa, the Irish Free State and Newfoundland. From this list the Irish Free State, South Africa and Newfoundland have now been withdrawn. The conferment of Dominion status upon India and Pakistan was effected by a separate Act, the Indian Independence Act, 1947. This Act was more complicated than the Statute of Westminster because it created the two separate countries of India and Pakistan, provided them with interim Constitutions, authorized their constituent assemblies to enact permanent Constitutions, and gave their legislatures the same powers as the Dominion Parliaments had under the Statute

of Westminster. The two constituent assemblies in fact enacted republican Constitutions. No such complication was needed in Ceylon, Ghana, Nigeria or Sierra Leone. The Constitutions were enacted separately by Orders in Council, and an Act of Parliament was needed only to confer 'Statute of Westminster powers' and make consequential amendments to various United Kingdom statutes. The Federation of Malaya Independence Act was slightly more complicated because the Malay States had been British protected States

As has been mentioned, the Irish Free State and the Union of South Africa used the powers of the Statute of Westminster to secede from the Commonwealth. The only other territory which has seceded is Burma The decision was taken by responsible Burmese Ministers before independence had formally been conceded. Accordingly, the Burma Independence Act, 1947, provided not for 'Statute of Westminster powers', which would have authorized secession, but for outright secession In relation to Canada, Australia, New Zealand, Ceylon (until it becomes a republic), Nigeria and Sierra Leone there are still ties with the United Kingdom because they share the monarchy with the United Kingdom This is a purely formal tie because the Queen is Queen of Canada, etc, as well as Queen of the United Kingdom, and in relation to Canada she always acts on the advice of her Canadian Ministers Generally, in fact, the Governor-General of Canada acts on her behalf, and he is advised by Canadian Ministers in the same way as the Queen herself is advised by United Kingdom Ministers in the United Kingdom. It would be theoretically possible for her to migrate to Canada and appoint a Governor-General for the United Kingdom.

Canada and Australia have another legal tie with the United Kingdom because certain types of constitutional legislation (that affecting the federal structure in Canada and that altering the States of Australia) can be enacted only by the Parliament of the United Kingdom. Such legislation would be enacted only at the request and with the consent of the Government and Parliament of Canada or Australia, and the

tie remains only because both Canada and Australia have not asked for it to be removed. Also, the States of Australia have insisted on retaining a direct link with the Crown, have their own Agents-General in London and communicate with the Commonwealth Relations Office in all matters within their jurisdiction Subject to these qualifications, all the independent members of the Commonwealth have full power of constitutional amendment in accordance with their own Constitutions They have, it may be said, been sent into space with sufficient power, provided by Act of Parliament, to go into orbit where they will Ghana, for instance, decided to become a republic with a presidential system of government. This was done lawfully under the Ghana Constitution and the Ghana Independence Act. The *coup d'état* in Pakistan, under which the greater part of the Pakistan Constitution was suspended was, like all *coups d'état*, unlawful, but, Pakistan being an independent country, it was no concern of the United Kingdom or any other country of the Commonwealth.

The one apparent exception arises when a monarchy within the Commonwealth wishes to become a republic and yet remain within the Commonwealth. This is not a legal requirement, but it has a firm foundation. The foundation is that, in some parts of the Commonwealth and in particular in the United Kingdom, Commonwealth co-operation (e g in respect of enforcement of judgments, transfer of accused persons, copyrights, etc.) is ensured by legislation deriving from the colonial system which related to 'Her Majesty's dominions'. When India became a republic and so ceased to be part of the dominions of the Crown, authority had to be given by Act of Parliament for the amendment of this legislation Accordingly, when it was agreed by the Commonwealth Prime Ministers that India should remain within the Commonwealth, the India (Consequential Provisions) Act was passed by the United Kingdom Parliament—not to change the laws of India, but to change the laws of the United Kingdom in relation to India Similar legislation was passed in relation to Pakistan and Ghana

It is true that legislation has also to be passed when a Commonwealth country secedes, as was done in the Burma Independence Act, 1947, and the Ireland Act, 1949. In the case of South Africa a temporary Act was passed maintaining the *status quo* until permanent legislation could be passed The Commonwealth is a 'free association' conferring privileges on all British subjects or Commonwealth citizens The right to secede is inherent in 'free association', but 'free association' confers no right to insist that the United Kingdom, or any other Commonwealth country, change its laws.

In the British tradition, the nature or extent of legal power is less important than the manner of its exercise Blackstone long ago drew attention to the vast prerogatives of the King, and, though they have been diminished by legislation, the volume of statutory powers has increased When we examine the legal content of the so-called liberties of the subject, we begin to wonder whether they exist at all, so vast are the powers for interfering with liberty. The fact is that the British Constitution everywhere assumes that powers will be exercised, if at all, reasonably and tolerantly The Dominions had, in 1926, reached the stage where none of the formal legal powers remaining in the hands of Great Britain could be exercised save in consultation with the Dominion concerned Canada, Australia and New Zealand took just sufficient power to prevent inconvenience arising from the old rule of the supremacy of Parliament. South Africa was the self-conscious Dominion which wanted the relics of past subordination swept away General Hertzog pressed for the Statute of Westminster His Government proceeded, in 1934, to the enactment of two Acts, the Status of the Union Act, 1934, and the Royal Executive Functions and Seals Act, 1934, which gave effect to South Africa's equality of status Even this did not satisfy the Nationalist aspirations, for the Crown appeared to be a relic of past subordination. The decision to create a republic implied, however, a decision by the other members of the Commonwealth to accept South Africa's membership as a republic, and this, in turn, involved criticism of South Africa's

racial policy The withdrawal of the application for continued membership forced the Union Parliament to use the powers of the Statute to secede from the Commonwealth. In this respect the South Africans followed the example of the Irish, for the Statute of Westminster gave Fianna Fail, when it came into office in 1932, power to revoke unilaterally the agreement of 1921 on whose basis the Irish Free State had been established The danger was foreseen in 1931, but it was rightly put aside, for if the Irish intended to repudiate the agreement the mere absence of legal power would not stop them.

10

CONSULTATION AND CO-OPERATION

ONCE upon a time a group of 'foreign' students were having lunch in a hostel of the University of Benares, in India They included an American, an Englishman and a Fijian. The American remarked that it was a great nuisance to have to report to the police regularly and said that it was not necessary for aliens to do so in his country. The Fijian looked surprised and said that nobody had asked him to report. 'Nor me,' said the Englishman, 'we are British subjects, and therefore we do not have to report ' There is indeed a provision of the Indian Nationality Act which, without referring to the Commonwealth, enables the Government of India to exempt a class of persons from some of the disabilities of aliens, and Commonwealth citizens benefit from such exemption

What privileges are granted to British subjects or Commonwealth citizens (either phrase may be used under United Kingdom law), or to companies registered in Commonwealth countries, or to goods originating in Commonwealth countries, depends upon the law of the country concerned. In Ceylon they are very few. In the United Kingdom they are very considerable. When, for instance, an Indian citizen lands at Southampton, he is directed to the same queue as those carrying United Kingdom passports. They present their passports and pass on, for they have a right to enter the United Kingdom, he presents his Indian passport and similarly passes on, for he is, as an Indian citizen, a British subject, and therefore has the same right as a citizen of the United Kingdom and Colonies to enter the United Kingdom. In the other line are the aliens, who fill up forms, answer questions and have to secure permission to enter Such

permission may be conditional on not obtaining employment, or involve rules about reporting changes of address. On the other hand the Indian citizen not only has the right to enter, but also to obtain employment, benefit from British social services, engage in political activity, be admitted to and practise a profession, and so forth, in precisely the same way as a citizen of the United Kingdom and Colonies. He may indeed be registered as a citizen of the United Kingdom and Colonies if he resides for one year, though in that case he may lose his Indian citizenship. This is one example only, and it shows that the Commonwealth relationship is not in all respects a relation among Governments, it is a relationship in which Commonwealth citizens have a direct and personal interest.

Conventional co-operation

British nationality law is less important in itself that in the attitude of mind which both encourages the making of special provisions for Commonwealth citizens and encourages Commonwealth citizens to think of themselves as such Since a British subject from any part of the Commonwealth is not and cannot be a 'foreigner', it seems entirely proper that he should, if he so desires, enter an English school or university, be called to the English Bar, be trained in a British hospital, be elected to one of the Engineering Institutes, or acquire any other qualification that a British subject might want to have The doctrine recently preached in Singapore, that an 'expatriate' professor ought not to comment on local politics, could not be preached to a citizen of Singapore resident in England, even if he were only a 'bird of passage' and not, like his Prime Minister, a member of the Senate of the University of Cambridge for he could engage in British politics, exercise a vote, stand as a candidate for Parliament and, if elected, condemn the Government or the Opposition with all the vigour of a citizen of the United Kingdom and Colonies.

These privileges accrue as a matter of course, but they accrue only to those who come to the United Kingdom It must, however, be remembered that, no matter how different

be the cultures of the Commonwealth, there are remarkable similarities in many social institutions, from religious foundations and universities to cricket teams In a democratic country the range of activity outside the realm of politics is more important to the individual than the range of activity within politics. The reality of the Commonwealth is better shown, not by the relations between Governments, which depend on the manner in which politicians pose to their electorates, but by relations between persons and institutions. The fact that John corresponds with his 'opposite numbers' in Toronto, Sydney, New Delhi, Karachi, Accra and Trinidad is more significant than an array of treaties designed to improve cultural relations In some cases there are formal organizations, such as the Association of Universities of the British Commonwealth, the Commonwealth Parliamentary Association, the Commonwealth Press Union, the Conference of Engineering Institutions of the British Commonwealth, the Empire and Commonwealth Industries Association, the Commonwealth Shipping Committee, the Conference of Commonwealth Meteorologists, etc In other cases there is no formal organization but the appropriate British institution acts as host to visitors from overseas and supplies information and assistance whenever it is asked Among such institutions are some of the most important elements in British social life, such as the churches, the Bank of England, the British Broadcasting Corporation, the Royal Society, the British Academy, the Royal Colleges, the Federation of British Industries, the Trades Union Congress and the Marylebone Cricket Club

What is significant is that, in spite of a network of organizations created by or under the auspices of the United Nations, or by or under the auspices of the State Department of the United States (with ample funds at its disposal), the channels of communication among the countries of the Commonwealth are so numerous and so much used What is more, they have no political purposes The Governor of the Central Bank of Ceylon will attend a conference in New York, but call on the Governor of the Bank of England on his way home The

Director of Education for Trinidad will attend a UNESCO conference in Paris but call on the Secretary of the Cambridge Local Examinations Syndicate. Those examples can be multiplied ten thousands of times What is more, there is a vast Commonwealth literature to be found in the catalogues of the Royal Commonwealth Society, varying from this little book to the *Cambridge History of the British Empire.*

The official channels

Emphasis needs to be placed upon the unofficial channels because the official channels have become less important since this book was first published in 1948 The influence of the Government of the United Kingdom in world affairs has progressively declined during the present century, and especially since 1939 This tendency was foreseen late in the nineteenth century, and it encouraged those who disliked it (mainly the Conservative imperialists) to seek to convert the British Empire into an organic institution whose 'wide open spaces' would gradually fill up and whose great collective resources would, it was hoped, carry on the traditions of Victorian Britain as the greatest of the 'great powers' This imaginative exercise was based on the assumption that Canadians, Australians, New Zealanders and South Africans, not to mention Asians and black Africans, would be anxious to join with the United Kingdom in a rather unequal partnership which would make the British Empire, like the land of hope and glory, 'mightier yet'. From the 'twenties the Dominions, as they were then called, began to take an independent line in international affairs, though they generally followed British policy and still (except Canada) relied on the British Government for their defence Since 1941 the United Kingdom has depended for her own defence on the vast resources of the United States The Congress of the United States has resisted the temptation to revert to the isolationism of the 'thirties and has therefore enabled the Government of the United States to assume the leadership of the 'free world' Consequently, the lack of fundamental divergence in the policies of the 'Old

Commonwealth', i.e. the United Kingdom, Canada, Australia, New Zealand and South Africa, has been due less to the existence of the Commonwealth than to the acceptance of American leadership by their several Governments.

The 'New Commonwealth', except Pakistan and perhaps Malaya, has generally not accepted this leadership. Though belonging ideologically to the 'free world', the Governments of India, Ceylon and the African countries have refused to accept the conclusion that they should belong to what they call the 'western bloc'. They have usually denied, though in some cases with increasingly less assurance, that the danger to their independence comes from the 'communist bloc' either by subversion and *coup d'état* or by direct aggression. It is significant that the Governments of Pakistan and Malaya have resisted the temptation to pretend to be 'neutral' or 'uncommitted'. The Soviet Union has infiltrated into Afghanistan and has therefore compelled the Government of Pakistan to keep large forces stationed near the North-West Frontier. With American aid these forces have been equipped to repel an invasion by 'conventional forces'. The Government of India has preferred to regard these forces, not as India's first line of defence, but as a threat to Kashmir. On the other hand, the Indian Government has reacted rather more strongly to communist subversion, which achieved some success in Kerala, and to Chinese infiltration. Subversion and Chinese infiltration are also the principal dangers in Malaya. Indeed, while Malaya was still under British rule it was selected by the Asian communists as suitable territory for a typical communist insurrection, by means of guerilla forces disrupting social life. These communists could also use the 'anti-colonialist' argument—which, as we have seen, was converted from 'anti-imperialism' for this very purpose. Tunku Abdul Rahman at first overestimated the 'anti-colonial' element in this insurrection; but his negotiations with Chen Ping, the communist leader, convinced the Tunku's Government that any sort of compact would result in communist subversion, of the type which is proving increasingly successful in Ceylon.

The result of these developments is that defence and foreign affairs can no longer be spoken of in Commonwealth terms. Foreign affairs in all parts of the Commonwealth are concerned primarily with defence against communism, but they are complicated by attacks on 'colonialism'. Defence against communism involves the United Kingdom, Canada, Australia, New Zealand, Pakistan, and in some measure Malaya, in a series of different pacts in which countries outside the Commonwealth are also concerned—NATO, CENTO, SEATO and the Pacific Pact The attacks on 'colonialism' have had, and still have, some communist inspiration. 'Anti-imperialism' was common form among the nationalist parties which 'fought' for independence in Asia and Africa, and they took the bait very readily. Nevertheless, though the newly independent countries have sought to collaborate as 'Bandung' or 'Afro-Asian' powers, they have also tended to fall into racial groups whose interests are sometimes in conflict, e g the West Africans, the Arabs, the Muslims generally, and the peoples of South-East Asia.

Another factor is that the Commonwealth 'Club' now contains twelve members and an 'observer' (the Federation of Rhodesia and Nyasaland) and that the membership is increasing rapidly. Periodical Imperial Conferences, such as were held before 1937, had in any case become of little importance because of acceleration in the pace of events They became impracticable as the number of members increased, because it was impossible to expect that the Prime Minister, four or five Ministers, and an array of permanent officials from every country could be in London, and therefore away from their own country, at the same time. These conferences have been replaced by informal meetings of Prime Ministers (some of whom may in fact find it necessary to send deputies), who have what are called 'exchanges of views' These exchanges no doubt influence policy, less perhaps because the Prime Ministers learn anything than because they become convinced of each other's sincerity and good will and understand more of the political difficulties in the several countries Certainly

United Kingdom policy is tempered by Commonwealth opinion, and, though Mr Krishna Menon uses his vitupera-tive skill against the United Kingdom Government at least as much as against everybody else—long residence in London has enabled him to speak the language metaphorically as well as literally—Mr Nehru often shows that he has freed himself from some of the presuppositions by which many lesser nationalist politicians are shackled He does not always agree with Mr Macmillan, but he seldom misunderstands or mis-represents him Possibly, too, the private discussions are at least as important as the more formal 'exchanges of views'. At least they take some edge off controversy

The increase in the number of independent members of the Commonwealth has widened the range of functions of the Commonwealth Relations Office It has what is in effect a substantial diplomatic service. Indeed, it is no longer easy to see why the Commonwealth Relations Office should be re-sponsible for the diplomatic service in the Commonwealth (and in the Republic of Ireland) while the Foreign Office is responsible for the diplomatic service in other countries The obligation of prior consultation with Commonwealth countries remains, but it has been extended, since the opening of the cold war, to the United Kingdom's western allies. Nor can it now apply to those aspects of foreign affairs which depend on secret defence measures These would be discussed with the western allies, but not with all the Commonwealth Govern-ments. Certain matters relating to the Crown would be dis-cussed with those Commonwealth countries which recognize the Queen as such, but not with the republics Certain other matters, such as the admission of Cyprus to the Common-wealth, would be the concern of all the countries of the Commonwealth On the other hand, the Colombo Plan, which began in 1951 as a scheme whereby the other countries of the Commonwealth could give technical assistance to the Com-monwealth countries of south-east Asia (it was approved at a meeting of Commonwealth Ministers in Colombo in 1950), has become an international arrangement, with Japan, the

United States and the International Bank among the contributing members, and eight non-Commonwealth countries among the receiving members It would therefore seem that the United Kingdom High Commissioners in the Commonwealth countries do very much the same sort of work as the British ambassadors in the non-Commonwealth countries and it may be noted that, while the distinction between High Commissioners and ambassadors is drawn by other Commonwealth countries, the United Kingdom is the only country with separate Ministers in charge of Commonwealth affairs Elsewhere in the Commonwealth, such affairs are included under the broader term 'external affairs'.

We tend to exaggerate political relations Politicians are articulate people who get their names into the newspapers They are easily accessible to journalists and are nearly always willing to make 'statements' and to hold Press conferences They move from one headline to another. Indeed, as they move about the world they move from one newspaper to another They are responsible people doing very responsible jobs, but the publicity which attends their actions tends to make us forget that ninety-nine hundredths or even nine hundred and ninety-nine thousandths of the work is done by officials who do their best to keep their names out of the newspapers. If anything comes from the 'conferences' or 'talks' in which politicians indulge, it is because they have been well prepared by the officials and action has been taken on them by the officials Even the speech which makes history will probably have been based on a draft supplied by an official For most of the work of government, however, there are no speeches, conferences, 'talks' or Press conferences

In respect of nearly all matters of government, technical and otherwise, there is liaison among the 'opposite numbers' in the Commonwealth Often there is a formal organization. For instance, the *Commonwealth Year Book* lists thirteen institutes and bureaux concerned with different aspects of agriculture, co-ordinated by an executive council whose office is in Farnham Royal, England In a very different sphere is

the Society of Clerks-at-the-Table, composed of the clerks to the legislatures of the Commonwealth. Sometimes, however, there is no organization, but merely a practice of consultation. United Nations organizations like UNESCO, WHO (World Health Organization), ECAFE (Economic Commission for Asia and the Far East) and the Commission for Technical Co-operation in Africa South of the Sahara have perhaps made Commonwealth assistance less important. On the other hand, Commonwealth experts speak the same language and have had a similar training They have been to similar universities—organized, as we have seen, in the Association of Universities of the British Commonwealth—and belong to the same, or similar, professional bodies It is therefore easier for them to consult each other, and they do so frequently What is more, most of the United Nations' experts are employed on short-term contracts, and their quality is uneven, whereas most of the important intra-Commonwealth consultations are between officials doing similar jobs Informal contacts through official channels are in fact as important as informal contacts through unofficial channels Capped by the political relations of Prime Ministers and other Ministers, they make up the substance of the Commonwealth The Commonwealth is an entity, but it is a very different entity from the federated British Empire contemplated by some of the enthusiasts at the beginning of the present century

Cultural relations

The foundation on which the Commonwealth rests is seldom mentioned. It is community of culture. In view of the anxiety of Asians for the development of their own cultures this may seem surprising It appears less surprising when it is noted that the political leaders are Field Marshal Ayub Khan, of the Royal Military Academy, Mr Jawaharlal Nehru, of Harrow and Cambridge, Tunku Abdul Rahman Putra, of Cambridge and the English Bar, Mr Lee Kuan Yew, of Cambridge and the English Bar, and the widow of the late Mr S. W. R D Bandaranaike, of Oxford and the English

Bar Of the sixteen Prime Ministers in the Asian countries of the Commonwealth between 1947 and 1960, eight had been educated at Cambridge and two at Oxford Most of the others had been educated at Indian universities founded on English models.

The most important element in the common culture is the English language Though a great many other languages are spoken and great efforts are being made to stimulate the development of the Asian languages, English is the usual language of administration in the Asian countries and the only language of administration in the African countries. French-speaking Canadians are bilingual Except in Quebec, India and Ceylon most secondary education is in English Except in the French-speaking universities of Canada nearly all university courses are in English.

What is more, except in Canada (where American influence has been considerable), the educational system has been founded on that of Great Britain—usually, indeed, on that of England. The schools were founded by British missionaries, or by British administrators, or by persons educated in schools of the English type The early teachers were imported from Britain and the training colleges are based on English models The syllabuses of the post-primary schools have been modelled on those of English schools. The external examinations taken by many of the pupils have been, and often still are, those of Cambridge and London, and where distinct examining bodies have been set up their work has been based on that of Cambridge and London The universities of Australia and New Zealand were founded on the Scottish model The universities of India and Pakistan were founded on the London model but have been modified in consequence of more recent English experience, injected through the Calcutta University Commission of 1919 The universities of Ceylon and Malaya have been influenced both by London and by Cambridge, but in other respects their model was Leeds Further adaptations of the schemes of the English civic universities have been made in the university colleges of the West Indies, and in West, Central and East Africa, which are also in 'special relationship' with

the University of London The universities and colleges so established develop their own traditions and therefore diverge from their models—as indeed is most noticeable in India—but the appeal to British university traditions is a constant feature of university life and is made easier by the fact that so many members of academic staffs have had some part, at least, of their education in the United Kingdom Nor do Ministers of Education, arguing with Vice-Chancellors, hesitate to cite British precedents when it suits their purpose to do so

The communities of British people in Canada, Australia, New Zealand, Rhodesia and Kenya are in frequent touch with 'home' and are continually being strengthened by migrants. Communications by air and wireless telephone hinder the development of a separate culture, though at the same time they also encourage American influence—Sydney differs from Melbourne, for instance, in being more cosmopolitan, though this is partly due to wartime experience and partly to the influx of immigrants from southern Europe What is striking, however, is the Englishry—to use a term which has almost become obsolete—of the English-speaking people in the Asian and African countries of the Commonwealth Mr Lee Kuan Yew, Prime Minister of Singapore, has said very truly that his English education has tended to cut him off from the other Chinese of south-east Asia. But it is not only his education. The law which he practises so efficiently when he is not in office is English law (which he learned in Cambridge and the Inns of Court); the politics which he preaches both in and out of office derive from Great Britain; it is reasonably certain that most of the books, magazines and newspapers that he reads come from England or are of the English type, his favourite game comes from Scotland, the fan which turns over his head (if his office has not been air-conditioned) probably comes from Britain, the paper on which he writes comes from Britain, and, but for the climate (for which Britain for once cannot be blamed), the whole atmosphere in which he lives derives from Britain Even his wife, though born in Asia, was educated at Cambridge.

Mr. Lee has, of course, been taken merely as an example Almost anybody else among the English-educated would do. Mr M. K Gandhi, of Lincoln's Inn, barrister-at-law, reverted to the life of an Indian *guru*, but it is plain from his *Autobiography* that Mahatma Gandhi's ideas were profoundly influenced by his reading in English and his experience of people in England and South Africa. Mr Nehru is even more westernized. President Ayub Khan is a typical Sandhurst-trained officer of the former Indian Army Mr. Bandaranaike's alleged 'national costume' (it was invented by two Ceylonese educated in England) was not very appropriate to the mannerisms which he had acquired in the Oxford Union Society, and his widow would not have become Prime Minister if she had not been educated by the Methodists. Tunku Abdul Rahman was able to achieve independence for his country because, though half Malay and half Siamese, he could talk sensible English to English-speaking Chinese and Tamils

Indeed, self-government was possible in the Asian countries because there was an English-educated minority ready and anxious to assume responsibility. There was a stage at which eager nationalists saw the sinister hand of 'British imperialism' in any attempt by British educational experts to develop education through the local languages The London Matriculation and the Cambridge Senior were the roads to Government jobs and political advancement Any Englishman who wanted to substitute Sanskrit for Latin must be trying to suppress the nationalist movement Later, the tide turned full circle, and the 'British imperialists' were accused of introducing an 'alien culture' in order to suppress 'national culture' This is, of course, the language of the hustings. There is a genuine dilemma Though there is little exclusively national about English or any other culture, it is true that the culture of the United Kingdom is attuned to its environment. To transport it bodily is to create misfits. On the other hand, there would never have been more than a primitive culture in England if there had not been constant infusion of ideas from outside, especially through the Christian Church, the

Normans, the more modern Frenchmen and the classical languages To imagine that any culture in Asia can be developed without a large infusion from outside is to imagine impossibilities but any infusion at all became an insult to nationalism. The Kandyan dance is, for instance, the only indigenous dance in Ceylon (though it has been described by Indians as a degenerate form of Indian dancing) It is rather like *John Peel* with a dozen variations It cannot be made into anything more than rhythmic acrobatics without a large infusion of Indian experience, but when it becomes Indian it ceases to be Kandyan and therefore has to be condemned.

For reasons which the historical geographer has no difficulty in explaining, the development of ideas from the fifteenth century was led by the peoples of north-western Europe The Asian peoples, though speaking languages which were as capable of development as those of Europe—and indeed the Sanskritic languages and those of Europe probably have a common origin—did not share in this development except in so far as they came into contact with Europeans The Renaissance touched them only in isolated pockets Brahmins and Buddhist monks kept their traditional learning but had no contacts with scholarship elsewhere Hence the 'new learning', as the Europeans called it, had to be acquired through the European languages, and must continue to be so acquired until it is absorbed into the Asian languages, a process which inevitably takes two or three generations

When that happens, the cultures of Asia will be 'national' only in the sense that the cultures of Europe are 'national' that is, there will be superficial differences due to language, religion and environment, though the corpus of knowledge will be identical. Politicians are, however, always in a hurry because they have to create the New Jerusalem before the next election, and it is easier and quicker to suppress education through the medium of English than it is to incorporate the corpus of learning into the national traditions. Indeed, the politicians cannot do more for the latter than offer financial assistance. There has been some reaction in India, led by

experienced university administrators who fear a lowering of educational standards; and policy in both Pakistan and Malaya has been cautious Ceylon, as usual, is the impetuous island, though its large bilingual population and its numerous external contacts may possibly bridge the chasm of ignorance into which a charming people are being pushed by their politicians.

Fortunately this kind of problem does not arise—or at least has not arisen—in Africa Indeed, the fact that the leaders in the campaign for the development of 'Bantu civilization' are the Afrikaners of the Republic of South Africa is enough to give any such campaign a bad name. Language and other cultural elements were far more backward in most parts of Africa than in most parts of Asia, and there cannot be any doubt that intellectual development must occur through the widespread use of the European languages, except in the north-east, where they compete with Arabic.

The common culture of the Commonwealth is perhaps a passing phase. Independent peoples will not be able to retain their place in the world unless they share in the common culture of intelligent and educated men but they need not follow the English in particular, and though there will be relics of British rule for centuries, each of the countries will no doubt develop its national characteristics out of its own experience and its peculiar relations with other countries

11

AN ASSESSMENT

AN ANALYSIS rests on facts even if the selection be a matter of opinion, an assessment is necessarily subjective. Yet one cannot avoid asking, and at least attempting to answer, the question whether the British Commonwealth of Nations has proved to be a valuable institution not merely to the peoples who compose it, but to the world at large

The British Commonwealth of Nations is a collection of twelve sovereign and independent States Great Britain, aided by the countries concerned, has performed the remarkable feat of converting nearly all of her colonial Empire into independent nations without losing their collaboration or even their esteem. She has not always acted wisely In the opinion of most she acted unwisely in North America and lost the opportunity of creating a great British nation from the Gulf of Mexico to the frozen North The United States of America would not necessarily have been a better or more useful country if it had remained within the Commonwealth It is impossible to re-write history, to forecast what sort of world there would be if somebody had acted differently yet the imagination suggests that the great American nation would have been greater still if it had never had any conflicts with England and could have exploited Canada without the enormous effort and expense involved in creating a separate Canadian nation.

It may be said, too, that Great Britain acted unwisely in South Africa on several occasions which were turning points in the history of that country The situation was retrieved by the great gesture of 1906, when the victor in a war which perhaps she ought not to have fought gave back to two small countries the liberty for which they had contended and so enabled the South African nation to be born In Eire it will be said with

almost complete unanimity that British policy had been for generations, even for centuries, a series of blunders. Some at least will say that Mr. Gladstone was right in 1885 In Asia, British policy was benevolent but obtuse, though the problems were more difficult than nationalist politicians were ready to admit In Africa even the liberals are becoming frightened by the pace at which peoples far less experienced than those of Asia are being enfranchised and left to their destiny

It might even be said that the very idea of self-government and independent status was a blunder. The world has suffered too much from nationalist aggression to want more nations. The task of the future, a task which two world wars have failed to effect, will be to suppress national sovereignty, and the more nations there are, the more difficult it will be The French tried a different method for satisfying the aspirations of their colonial peoples An attempt was made to incorporate the colonies into France herself and to make their peoples French citizens. It was a complete failure, even in Algeria. Probably there is no alternative to the British method save ruthless suppression of nationalist movements, as practised by the Portuguese Government. Colonial peoples will not be satisfied with less than independence, and the only question may be whether it shall be independence inside or outside the British Commonwealth Even today, when the opinion which thinks itself enlightened is critical of the whole concept of national sovereignty, almost the whole of Asia outside the communist countries, and most of Africa, have achieved national independence Dr Nkrumah has indeed complained that the colonial powers have 'balkanized' Africa On the contrary, they created large units—for instance, Ghana and Nigeria—out of territories occupied by conflicting tribes They have been hindered by the Afro-Asian adoption of the principle of 'self-determination', which would justify the Ashanti in Ghana, the Yoruba and the Ibo in Nigeria, the Nagas and the Sikhs in India, the Sindhis in Pakistan, the Tamils in Ceylon, and the people of the Isle of Ely (the last Englishmen to resist Norman 'colonialism') in England in declaring their

national independence. Dr Nkrumah nevertheless has a point. The complete apparatus of a modern State requires substantial resources in men and material, and already there are too many people relying on 'external aid' which will vanish whenever the contributing countries run into economic difficulties. 'Aid without strings', if such a thing exists, is charity, and too many people think that charity begins at home

The British Government has done its best. It persuaded the Ashanti to accept government from Accra. Nigeria has been retained as a federation in spite of separatist movements in the Regions The Federation of Rhodesia and Nyasaland is under attack, not from the British Government, but from African 'nationalist' movements. In Northern Rhodesia the Barotse and in Uganda the Baganda have been urging further fragmentation. Closer union in East Africa has been frustrated by local forces, not all of them European The federations created by the French and the Belgians have already disappeared. The efforts of Dr Nkrumah himself have so far produced only paper agreements The essential difficulties are the anxiety of tribal authorities to retain their power and the anxiety of local politicians to achieve it All Arabs support the idea of Arab unity. they cannot agree upon the leadership It is better to be Prime Minister (or, better still, President) of the Isle of Ely than to be chairman of its county council.

If the phase of national sovereignty be inevitable, the Commonwealth has solved a large part of its problem admirably. It converted the white colonies into sovereign States and yet kept them closely entwined—for 'associated', though used in the Balfour Declaration, is too weak a word—in a co-operative Commonwealth It failed with the southern Irish and eventually with the Afrikaner minority of South Africa Even so, nobody in the United Kingdom or the Republic of Ireland really thinks that they are mutually 'foreign' countries, and even the Afrikaners expressed the hope that their relations with the United Kingdom would remain close. It has, secondly, performed the even more difficult task of converting India, Pakistan and Ceylon into independent countries associated—

and here the word is correct—with the Commonwealth. Whether more expert handling would not have avoided the separation of Pakistan from India, or at least have prevented the serious troubles which followed from partition, is at least arguable. Certainly mistakes were made in the 'twenties, and they may have caused the misjudgments of the Indian National Congress in the 'forties Nor was the process equally successful in Burma, though there too secession was effected peacefully and in such a manner as to leave friendly relations. Success in Africa is still in the balance

The relations which subsist within the Commonwealth must not be thought of purely in political and economic terms. British influence has perhaps been greatest in spheres where political issues are insignificant. In the long run the pen is mightier than the sword and even than the Parliamentary resolution Without producing great political philosophers, Britain has somehow created a political philosophy, or perhaps more accurately a theory of political institutions, whose success has been truly remarkable It applies in Burma and the Republic of Ireland and South Africa as well as in the twelve nations of the Commonwealth. If the version of it prevalent in the United States of America be included, this form of democratic government now covers nearly a thousand milion people, more than one-third of humanity Nor has it been without influence among the other two-thirds

Perhaps even more significant is the influence of British ideas and the English language entirely outside the political field. No doubt the wealth and political influence of the English-speaking countries have been the main causes for the spread of the English language, and yet the fifty million people of the United Kingdom are still intellectually powerful Eighty or more universities in the Commonwealth regard Oxford and Cambridge as their elder sisters, but hundreds of others consider them to be foremost among the cousins British professional standards have a world-wide reputation, within the Commonwealth itself they stand pre-eminent Indeed the close contacts within the Commonwealth outside the political sphere are more

significant than political relations because they are less self-conscious. The British Council can keep clear of politics precisely because British intellectual products can rely on their own merits

These factors become more important as political relations become less close and policies diverge So far as policies are concerned the nations of the Commonwealth require no leadership and the British Government has given up the attempt to provide it. Indeed, on political matters there is no unanimity in Britain itself. Some Commonwealth Governments find themselves more in sympathy with the Labour Opposition than with the Conservative Government. In respect of policies in the abstract, however, the two-party system is misleading. There are as many varieties of opinion in the Conservative Party as there are in the Labour Party, and there are more varieties in the Labour Party than appear at its conferences The United Kingdom provides for the Commonwealth not policies but a reservoir of knowledge and experience which can be drawn upon freely as occasion requires It can be tapped at any point, usually without reference to the British Government, and the intense organization of social life outside the Governmental sphere makes it easy to do so On every subject under the sun—and for that matter outside the solar system too—there is in Britain a body of experts organized in an association There are, of course, experts in other countries too, but here Britain has the advantage of size It is large enough to have a complete array of experts, but small enough to have them highly organized and easily accessible The technical organs of the United Nations can call up experts from all over the world, but its diversity of choice makes selection difficult. What is more, the Commonwealth experts speak the same language, not merely literally but also metaphorically *Time* magazine once poked fun at the English accents displayed in the Nigerian federal legislature ('Awdah, awdah!', 'Heah, heah!') But there was more to it than accent, for this was a legislature on the Westminster model, in which anybody from Westminster but nobody from Washington would have felt at home There was Mr Speaker and the

clerks-at-the-table, and there on the table was the green volume of Erskine May. Had the *Time* reporter visited a court of law, or a cement factory, or a retail shop, or an irrigation scheme, or a school he would have heard more English accents and seen more evidence of Commonwealth association.

No doubt these things will change, but they will change slowly. The great volume of knowledge and experience which the peoples of western Europe developed out of the literature of Greece and Rome, and then exported to the rest of the world, went to the rest of the Commonwealth through the English language and in British forms. Though the language may change (as it is doing in Asia) the legacy remains. Indeed, the apparatus of the Asian languages comes from Britain—grammars, dictionaries, editions of classical texts, histories and so forth. It is, of course, founded on international scholarship, for Britain has no monopoly; but the channels of communication have passed through London. Even more was this so where the subject-matter was not of local origin in the country concerned, such as science, technology, insurance, banking or law. If our civilization were wiped out and centuries hence archaeologists began digging about in the ruins of any city from Vancouver to Singapore or from Hong Kong to Accra, their first remark would be, 'The English were here.'

The legacy has been so substantial and so important that its effects will never be effaced. Nor have the executors yet paid in full. Independence is but a stage in the life of a people. Nor can any people be self-sufficient. It may import from any country, and many countries are anxious to export their intellectual wares. But people used to British ways will for decades if not for generations continue, if not in those ways, at least sufficiently near them to make the Commonwealth relationship, or something like it, worth while. It is significant that, while not more than one-fifth of the English-speaking people live in the United Kingdom, they produce two-thirds of the books in English and export two-fifths of them. These influences will, of course, continue whether or not the Commonwealth survives. It is, after all, a political relationship, and all political relation-

ships are fragile because they depend upon the whims of politicians who are here today and gone tomorrow.

Emphasis has been laid upon cultural relations, in the broadest sense, because the political relationship has become more tenuous since this book was first written thirteen years ago. Politically, the Commonwealth is still important because it is the only entity, outside the United Nations, which includes some of the peoples of all five of the continents. It is easy to underestimate the value of personal relationships among politicians. They produce those awful 'communiqués', full of sonorous platitudes, which every public relations officer can produce in his sleep. Nevertheless, meeting is the beginning of understanding. The names which appear in the newspapers and the telegrams cease to be mere names, because they are attached to real people. If a conference achieves nothing more than portentous generalities it inevitably includes discussion of points of view. Something of the political background of Canberra or Delhi or Accra is sketched in. One begins to understand why Menzies or Nehru or Nkrumah said this or did that. It is not true in politics that to understand everything is to forgive everything, and indeed if a politician understood everything he would be too formidable a prodigy. But a conference is the beginning of knowledge, and knowledge is the beginning of wisdom. Also, Prime Ministers have their camp followers, who learn much from personal contacts. The officials who sit silently on the back seats in Lancaster House and elsewhere are more attentive than their leaders, for they have not to think of their own speeches (though they have to think of their leaders' speeches). Besides these are all the luncheons, at the Anthenaeum and elsewhere, at which 'opposite numbers' entertain each other. For ever after the papers in the files, on which minutes and speeches are drafted, are alive in the minds of the draftsmen. The relations between London and Washington are almost equally close, and somebody in the Foreign Office can speak as learnedly about Liberia or Burma as anybody in the Commonwealth Relations Office can speak about Ghana or Malaya; but the frequency and the informality of the contacts makes for better understanding.

INDEX